AMERICAN JOURNAL OF

PUBLIC HEALTH

and THE NATION'S HEALTH

The 81st Annual Meeting, New York, N. Y.
November 9–13

Volume 43 **NOVEMBER, 1953** Number 11

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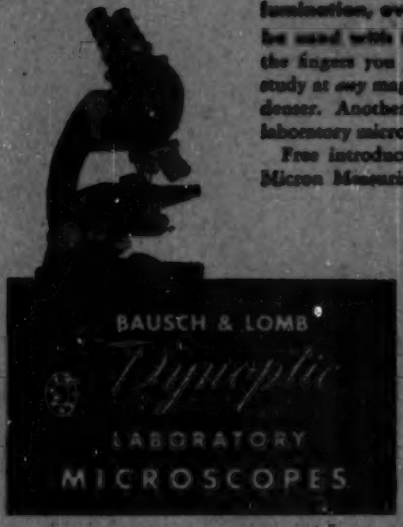

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Published by the American Public Health Association, Inc., at 374 Broadway, Albany 7, N. Y.
Executive Office, 1790 Broadway at 58th St., New York 19, N. Y.

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Address correspondence regarding editorial contents and manuscripts to C.-E. A. Winslow, Dr.P.H. Editor, 1790 Broadway, New York 19, N. Y.

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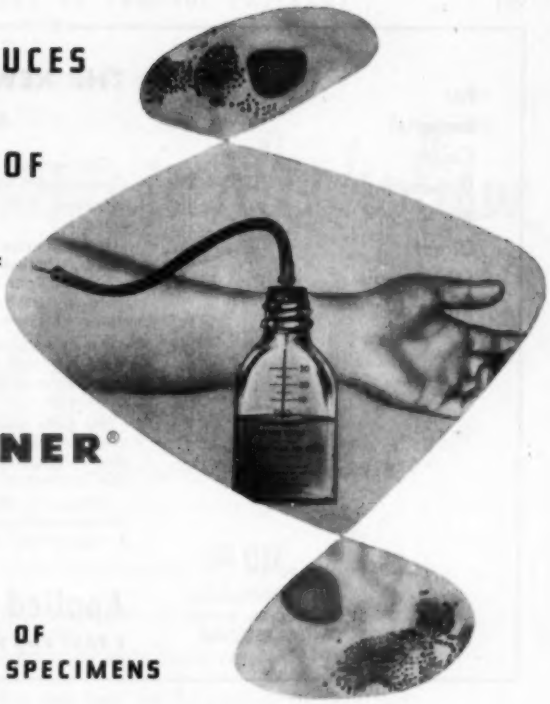

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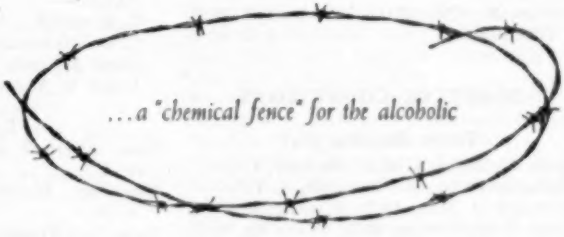

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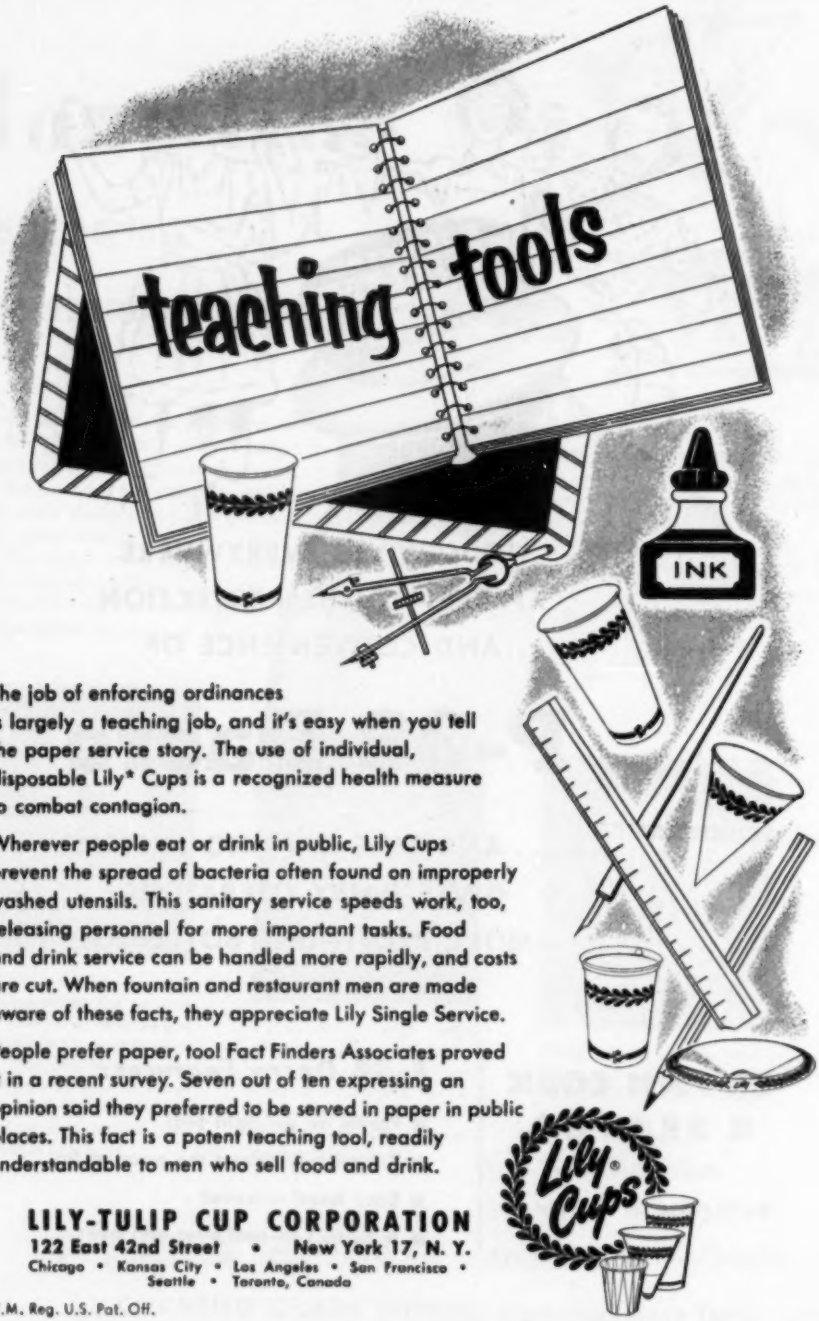

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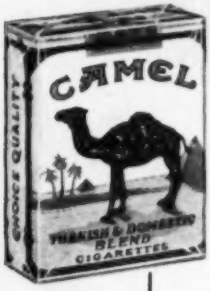

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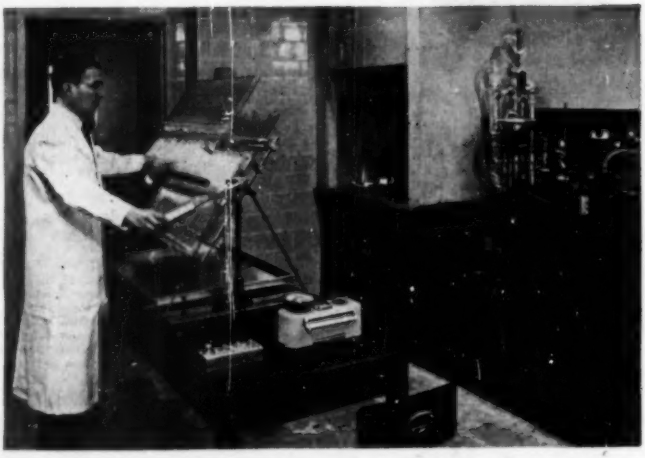

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1. McClellan, W. S., The Importance of Carbon Dioxide in the Human Body (unpublished paper)

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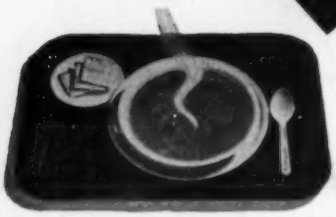

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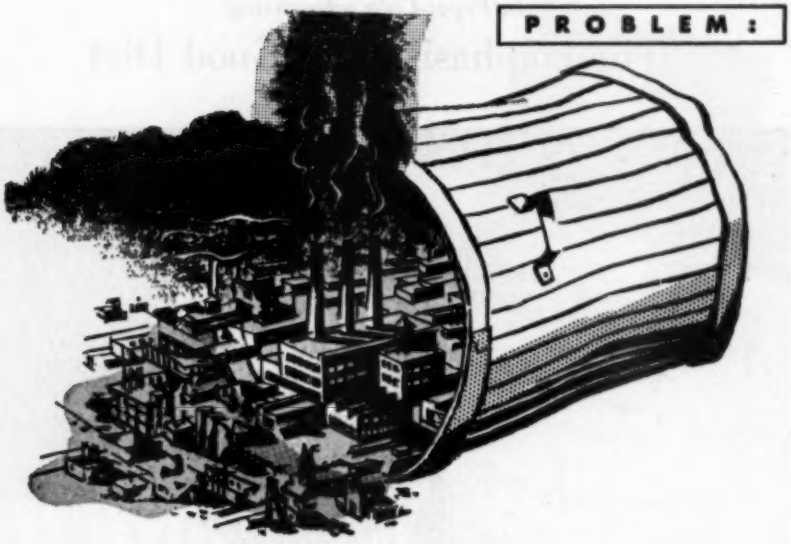

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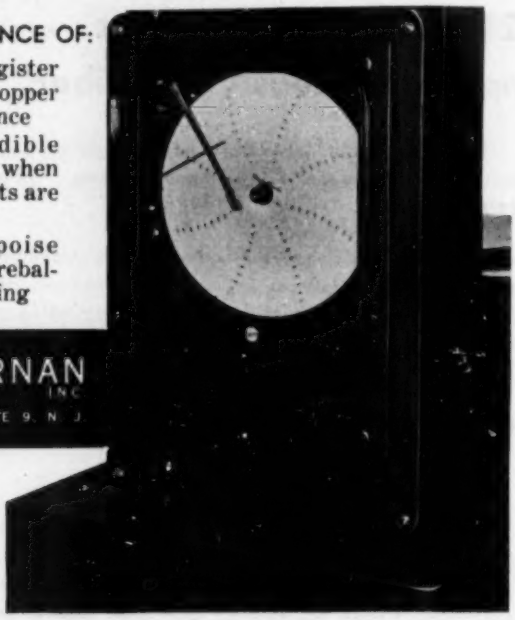

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American Journal of Public Health
and THE NATION'S HEALTH

Volume 43 November, 1953 Number 11

Hygeia: Service with Spirit and Ideals*

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"Blessed is he who carries within himself a God . . . ideal of art, ideal of science, ideal of the fatherland, ideal of the virtues of the Gospel, for therein lie the springs of great thoughts and great actions. . . ." (Pasteur, in his reception oration at the Académie des Sciences.)

THE Goddess of Health appears in my title because her gifts, it seems to me, are peculiarly desirable in those whose lives are devoted to bringing health to the people of our country and to our neighbors around the world.

In our field the best workers have always been men and women who were not only technically well trained but who were motivated by the spirit and ideals of service which have come down to us through the generations. This spirit springs from the religious ideals which are part of the history of the race. They are as deep and strong as any moving force can be. Pasteur recognized this. In his day the public health movement was young and struggling, but even then it showed prophetic vigor. The first great crusades were directed against the unbelievably filthy, dank and dark homes and factories of the burgeoning cities of that early industrial age. These crusades had their base and beginning in a humanistic concern for the individual. The principle of the welfare of the individual in public health practice has not materially changed over the years and was logically written into the constitution of the World Health Organization in these words: "The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."

The critical problems of Pasteur's time were those born of scientific ignorance. The crisis of today seems almost to be born of scientific triumphs. *Time Magazine* [1] suggests the present world dilemma by its analogy of two men facing each other with loaded, double-barreled shotguns at 20 paces. Is it like "two scorpions in a bottle" to use the words of Oppenheimer? [2] No informed person doubts that the two great opposing world powers have or will soon have enough deadly scientific equipment to blast the heart out of

* Presidential Address to the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 11, 1953.

every known population center or strategic area in both countries.

Dark as the prospect seems it will not help to adjourn our responsibilities. There have been other dark periods. I am reminded of the historic, literally, dark day of May 19, 1780, in New England. The lower house of the State Legislature at Hartford, Conn., had broken up in alarm. In the Senate a motion for adjournment had been made in order that its members might do whatever they thought appropriate in the face of a great calamity, possibly the Day of Judgment. I see in Abraham Davenport the equanimity of a Winslow or an Osler as he faced panic. He arose in his chair and calmly addressed his colleagues with a short speech against adjournment, "The Day of Judgment," he said, "is either approaching or it is not; if it is not, there is no cause for adjournment; if it is, I choose to be found doing my duty. I wish, therefore, that the candles may be brought."

How much better to hold even so small a light as a candle than to become panic-stricken in the darkness. In this period of crisis and uncertainty, we must use all the illumination available. We need the light of reason and science, but without a quickening of the spirit and ideals of service how shall we measure up to the great tasks ahead?

One experienced journalist[3] says, "Among thoughtful people of various creeds, and even of no creed, one can discern a growing consciousness and conviction that the world crisis is fundamentally neither economic nor military, but moral, ethical and religious . . . that Communism was born a century ago with Karl Marx and not out of World War I or World War II" and calls our society, "without basic loyalties one which is out of focus and which shows symptoms of disintegration." This writer's prescription for improvement in our poise and serenity is the "rediscovery of our country's religious loyalties."

The reading of Kennan's account of American Diplomacy[4] does not leave one with a feeling of pride in all of our relations with other governments of the world. We have been, if we accept his account, arrogant and inconsistent, often when we should have been wise and firm. Our foreign policy has not always been determined on the basis of a just relationship with our world neighbors such as a great power should have to remain respected and strong.

Some of our recent international conduct, as well as that in our own government, makes us think of conditions in Theodosian Rome when Romans no longer really believed in their gods, but depended on money and legions. They no longer really believed in truth but in policy. It was a time when only a spiritual awakening could save the nation. The spiritual awakening did not come.

This was brought sharply to my attention by a statement made by Robert Gros in a recent address to the American Dietetic Association.[5] He told of visiting the island of Taiwan (which most of us know as Formosa), now the seat of the Chinese Nationalist government. He had decided to find out in a direct manner whether the stories about the graft and corruption in the Chinese Nationalist government were factual. At his first conference with one of the leading officials he abruptly said, "What about the corruption in your government?" He was answered by a look of bewilderment and finally the words, "Oh yes, you mean mink coats, refrigerators, and five percenters?" Mr. Gros said he did not ask any more questions about the integrity of a government which has been fighting for its existence almost continuously for more than 30 years.

This world crisis and the relation of

our country to it forces on health workers a new and unusual responsibility. More than ever we must be aware of moral as well as scientific values.

TECHNICAL AID PROGRAM—HEALTH SERVICES

The Technical Aid Program is recognized by most of us as one of the most effective means we have of exporting the basic ideals of our country, along with some of the technologies needed in the so-called underdeveloped countries. Until recently, the interest of the majority of health workers in these programs has been passive. Today, as an Association and as individuals, we have constantly enlarging opportunities to assist in these far-reaching developments. Through the general instrumentality of what is now our government's Foreign Organization Administration, and in this hemisphere its much older division, the Institute of Inter-American Affairs, there have already been noteworthy achievements.

In my experience, the leaders of the Institute of Inter-American Affairs, who had the greatest success and who were most respected both by their associates from home and the nationals with whom they were working, were those who were imbued with the subtle stuff called "Americanism," which is included in the words "Service with Spirit and Ideals." In many areas our leaders were learning almost as much as they were teaching; often they were acquiring knowledge in the field of human relations rather than technical and scientific information. They recognized the capabilities of the health workers of the countries which had asked for their services. Those with wisdom played the game on a partnership basis, often backstopping and assisting the national health leaders with the prestige of the United States, often advising with them on technical matters when this was desired or needed, and finally by living the "Golden Rule."

My own investigation, admittedly limited, of the work of the bilateral health programs among the peoples of the small villages and large cities of Central and South America convinces me that our great need is a living philosophy. This philosophy should have at its core the worth of the individual. Such a philosophy permeates our greatest national document, the Constitution and the Bill of Rights, and can be reduced to simple words that the humblest can understand.

Imagine the drama of the dedication of a water supply in a small but important city, Tulcan, Ecuador. Rain water was available, but insufficient. All other water had to be carried. The people had worked to bring water from a stream for many years, but finally were stopped by rugged terrain. The Institute of Inter-American Affairs, with money furnished mostly by the town, finished the job. The dedication lasting for 10 days was a real celebration and there was gratitude for the help of the United States.

Or, in Quito, look over my shoulder as the mayor dedicates a hundred-unit laundry, not automatics but concrete tubs, the side to the operator slanted and scored for a washboard, and one cold water faucet for each of the hundred units. He called the attention of the huge crowd to the fact that the taxpayers of the small towns and cities in the United States of America had helped them to build this convenience. For them it was a real health facility because without it the women had to walk down the long hill of the town to the river, which was also the sewer, to do the family washing and then trudge back. The mayor is through. The band strikes up again, and scarcely before one sees what is happening every unit is in use by a woman with a child at her side or a baby on her back.

For myself, especially in the realm of public health activities, I am convinced that if we can acquire more of this living philosophy, and if we have the wisdom to apply it at home and among the nations with whom we deal, we will have a strength which no materialistic combination in our kind of a world can stand up against. Many of the people, poor for generations, will have more reason to be grateful for the life- and health-saving projects that are being developed in various countries of the world—hospitals, health centers, water supplies, sanitation facilities, laundries, and baths.

HEALTH SERVICE AT HOME

The staff members of the State Health Department with whom I have had the honor to be associated for more than 10 years have to a high degree the characteristics we are discussing. Those to whom the ideals mean the most do not necessarily vocalize them, but they are building the most effective programs and they also have the greatest degree of confidence in their associates. My appreciation for the loyalty, devotion, and integrity of this staff can never be adequately expressed in words.

Yet, there is more to it than individual loyalties and relationships. Good personal relations extend into good public relations, good organizational and interorganizational relations.

The health officer who runs his department as a dictator, who does not share the authority as well as the responsibilities of the department, cannot hope for the satisfaction of team play and the spirit and ideals of service. What is more important, he deprives his staff of these satisfactions.

The relationship between official health organizations—federal, state, and local—is unavoidably complex. Sometimes, though surely unintended, personnel of larger organizations appear superior to those in the smaller. You and I know that some of our greatest health workers are health officers in small places or are giving distinguished service in other ways. Often they fill positions which are not high on the ladder of health organization in such a way that they are the treasures of the group with whom they work, and have to an unusual degree the gratitude of those whom they serve.

Let me tell you of an experience which is developing a close working relationship between our state and local health agencies and which is developing increasing mutual respect and confidence. Six years ago California made available a small amount of state funds for local public health assistance, that is, it was small from a per capita standpoint, amounting to just over 22 cents for each person. There was, however, a factor which increased the allocation to the smaller communities proportionately up to about 82 cents per capita.

There is nothing so very spectacular about this state aid—except in one respect. The standards, which must be met by the various cities and counties and our one health district, were, as is customary, to be set by the State Board of Public Health. In this instance, however, the legislation required approval by the California Conference of Local Health Officers which the same legislative act set up and which is made up of all our local health officers.

Experts in governmental administration did not have kind words to say about this method of setting standards, and many wondered just what would happen. Today, there is evidence that this will prove to be the most important public health development which has occurred in our state during the past 10 years. Actually the conference has long ago outgrown its standard-setting functions and has become in large part the front line public health policy-forming group in our state.

The membership of the conference

elects its own officers. It divides itself into working committees, each having the responsibility of studying problems in one of the important fields of public health. Occasionally an *ad hoc* working group is set up for special problems. Proposals are made to the conference by members or by the State Health Department. Expenses for these working meetings are wisely provided by the state, which makes it possible to have continuity of attendance. The committees make their reports to an over-all coordinating group called the Committee on Administrative Practice before submission to the full conference comprising all local health officers. There, action is taken on the various committee recommendations.

Each health officer has the opportunity of participating equally in the activities of the conference, whether he represents the largest local health department serving a population of over two million people or whether he represents the smallest which serves a few thousand. During the year each health officer meets with the members of his committee three or four times and with the entire conference twice. The two-day committee meetings or three-day conference sessions, occurring as they do on the average of every two months, give a close and almost continuous working relationship. The local health officers work across the table with the state health officer and his representatives. Gradually most of our 53 local full-time health officers and our state staff have developed an increasingly greater interest in our state and local health policies and relations.

This was less apparent under the old system of public health administration which relied on state law or on rules and regulations of the State Board of Public Health or local governing bodies. There was informal consultation between state and local health officers from time to time, to be sure, and a single large annual meeting. At these there were, more often than necessary, loud and long discussions, often without crystallization of results because health situations and problems are often complicated and many-sided and require more than the product of discussion at an annual meeting. The State Health Department made the decisions.

Around-the-calendar working relationship between state and local health agencies is on the increase. The technical story of the development is important because with it has come increasing respect for each individual health officer and a greater degree of self-respect, increased administrative stature, and satisfactions which with the passage of time broaden the spirit and ideals of health service.

Relationships, such as I have briefly described, are properly not limited to official health agencies. Voluntary health agencies and professional societies have a vital interest and play a large part in the provision of health services in this great nation of ours; it is the nation of strong voluntary health agencies and professional societies of great power and influence, and the place of the private practitioner is usually on the front line of every health program aimed at the individual.

Our Association and its present and prospective members occupy a unique position. Compared in numbers to the membership of other professional societies, as well as to the participants in the programs of voluntary health agencies, it does not rank large. Yet it has a responsibility of being the conscience of all sincere health workers bequeathed to it by the founding fathers of the Association. Therefore, in times troubled by world crisis and by many potential changes in our social structure, we particularly need to remember such words on cooperation as: "It is impossible here below to do anything lasting or useful without the help of others," [6]

and "Confidence all the time and conference as often as possible."[7] Indeed, we believe, it is our special responsibility to forestall or to end unproductive argument and to devise and encourage ways and means to develop effective working relationships between all groups of health workers—relationships which will increase the respect of each for the other and which will through confidence and conference find appropriate answers to questions which are being asked by the people; answers which will, in so far as is possible, not place the professions or those who receive their services in a position which requires or invites opposition. Here again the key is the spirit and ideals of service.

WHAT ABOUT EDUCATION?

Does the world crisis call for new and unusual responsibilities from the health team? Does it really demand spirit and ideals of service? If the answer is yes, and I believe there can be no other, we have the challenge of doing something more positive about many of our relationships, certainly about our educational program. This is not original with me. Many leaders in education are no longer satisfied with the dearth of the moral, ethical, and spiritual values in the curriculum. President Colwell[8] of Chicago, Dean Sinnott[9] of Yale, President Zook[10] of the National Council on Education, and President Pusey[11] of Harvard, among many others, call for a return of these values to our educational program. They have spoken of the gains of science, though of tremendous importance, as secondary to the world's real need—a fuller cultivation of those qualities which are best termed spiritual.

President Eisenhower in his inaugural address, and again recently, stated that his whole message rested on one truth: "Whatever America hopes to bring to pass in the world, must first come to pass in the heart of America."

Much of what I have tried to say, and more, is said better by Dr. William Bennett Bean, under the title "Caritas Medici."[12] His thoughts are distilled in phrases such as: "The secret for the care of the patient is in caring for the patient." In contrast he says, ". . . that physicians and most members of our contemporary professions, by forsaking humanism and the feeling for continuity with history, have debased themselves to the role of technicians in a trade school age." I envy his mastery of prose style and I cannot leave him without a quotation which capsulates much of what I have tried to say.

"The fruitful and great tradition of Western society has been the worth of the individual and the freedom of the soul, and our society has drawn strength and sustenance from the inner revelations of saint and artist. It will continue at its own hazard if it abandons this source of inspiration for external manipulation and purely mundane solution of its problems. . . . No hot-brained physicist with his transistors and cybernetics is going to hoodoo *me* out of *my* mind, such as it is, or in the words of Walshe, interpret for me in microvolts and feed-back mechanisms in the brain the sonnets of Shakespeare, the Primavera of Botticelli, or the going out to death of Captain Oates in the dark wastes of the antarctic. There are more things in heaven and earth than are revealed by an amplifying valve." And finally, his plea "that somewhere into a habit pattern we put good manners and morals, that we recognize not only intelligence and emotions," but adds, "and I urge Spirit."

Pasteur, Bean, and an increasing number of scientists are not apart in urging marriage rather than divorce of science and spirit. The Goddess of Health would have approved, blessed such a sacrament, and we shall serve her best by honoring it in our motivation and our practice.

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1954 Conference on World Population Problems

A World Population Conference of Experts has been called by the Economic and Social Council of the United Nations in collaboration with the International Union for the Scientific Study of Population. The meeting is to be held at the headquarters of UN's Food and Agriculture Organization in Rome for nine days in the early part of September. Invitations to experts in their individual capacity to attend the conference will be issued by the UN secretary-general to nominees selected by governments, nongovernmental scientific organizations, and interested specialized agencies.

Those invited to attend the conference will have the opportunity to contribute a scientific paper up to 2,500 words long on a population subject. These must be in the hands of the Director of the Population Division, United Nations, New York, N. Y., by March 31, 1954. A limited number of copies of the announcement about the conference, which includes a tentative list of topics for discussion, is available from the division.

The conference will be financed jointly by the UN, the Italian government, some of the cooperating specialized agencies, and private contributions through the International Union for the Scientific Study of Population. Louis I. Dublin of the Institute of Life Insurance is chairman of a Finance Committee for the last named organization.

The Preparatory Committee for the conference is chaired by P. K. Whelpton of the Scripps Foundation for Research in Population Problems. Frank Lorimer, American University, Washington 16, D. C., is secretary of a Subcommittee on Arrangements. Questions relating to attendance of participants should be referred to him.

On the one hand are the high hopes stirred by a growing number of sanguine people who predict a poliomyelitis vaccine "just around the corner." On the other are our memories of early and unsuccessful efforts at polio prophylaxis, matching more recent difficulties with influenza vaccines. Just where do we stand? If you want a clear picture of current perplexities, and rising hopes, then this paper becomes a "must" for you.

Principles of Immunization as Applied to Poliomyelitis and Influenza*

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WITHOUT entering upon a discussion of the question of the mechanism whereby antibody is effective in the prevention of the microbial diseases, let us make the now reasonable assumption that the relationship between antibody and resistance is more than one of mere association—that it is one of cause and effect. It would follow from this that it would be desirable to raise and maintain the level of serum antibody above a critical threshold, because in so doing it may be expected that immunity will result. From evidence already available for influenza and poliomyelitis it is clear that the question which really concerns us is not whether this is so, but rather *how* it may be accomplished. It is the purpose of this presentation to attempt to answer this question.

It has long been known that antibody formation occurs, not only as a result of an infectious process which is accompanied by symptoms of disease, but following asymptomatic infections as well. Moreover, it has been shown that antibody formation may also be induced when a properly constituted preparation of a toxin, modified to be free of danger and called a toxoid, is injected, or, if a suitably killed bacterial or viral suspension is similarly employed. Thus, it would appear that the natural methods for inducing immunity may be simulated by exploiting one or more approaches based upon these fundamental considerations.

One approach, which is referred to as the method of variolation is the first that was employed in this way. Since it is based upon the principle of infection induced with an essentially nonpathogenic relative of the agent in question, such a method closely resembles the natural phenomenon. Some consider this to be a better approach than one in which immunity is induced by methods which do not employ infection by a living agent. However, there is evidence to suggest that it may be possible to improve upon natural methods of immunization.

It is to be recalled that variolation

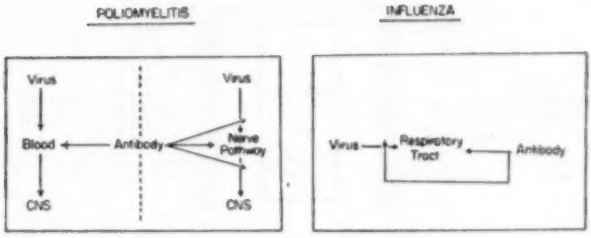
* Fourth Annual Don W. Gudakunst Memorial Lecture presented at the School of Public Health, University of Michigan, Ann Arbor, Mich., May 12, 1953.

NOTE—Studies on poliomyelitis referred to were aided by grants from the National Foundation for Infantile Paralysis.

Studies on influenza were conducted under the auspices of the Commission on Influenza, the Armed Forces Epidemiological Board, and supported by the Office of The Surgeon General, Department of The Army.

FIGURE 1

SITES OF MEDIATION OF EFFECT OF ANTIBODY
IN THE PREVENTION OF POLIOMYELITIS AND INFLUENZA



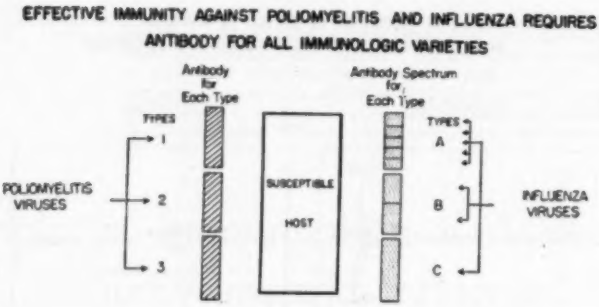
was employed before the science of immunology was born and, in the face of dangers with overwhelming odds, there was no other choice available at that time. The fact that poliomyelitis is a disease that can cause crippling would make it seem that even at great cost it is necessary to approach the solution, to the problem of this disease at least, without subjecting any human being to more than reasonable hazard. Although the risk of influenza continues and the risk of paralytic poliomyelitis is increasing rapidly, the advances in our knowledge of immunology and immunologic mechanisms and the development of the means for inducing the immune state artificially have so progressed that these dangers may well be overtaken by procedures that do not entail the risk of acquiring the disease in the course of attempting to induce a state of immunity.

IMMUNOLOGIC CONCEPTS

Sites of Mediation of Antibody Effect—The ways in which antibody may function in the prevention of paralytic poliomyelitis, or influenza, are illustrated diagrammatically in Figure 1. It may be seen that for the antibody to be effective in intercepting the virus of poliomyelitis, before invasion of the central nervous system, it would be necessary that this take place either in the bloodstream, if this is the avenue to the central nervous system, or that antibody be able to intercept the virus as it may move along nerve pathways. If the recently demonstrated viremia stage represents a constant occurrence before invasion of the central nervous system, then relatively little antibody would be necessary to intercept the virus on its way to the centers where the irreversible damage is done. On the other hand, it has been amply shown—directly in experimental animals and, indirectly, in human subjects—that the virus of poliomyelitis may at times proceed along nerve pathways. It is evident that in one case less antibody would be required than in the other. We shall return to this question again later.

In influenza, where the virus attacks the surface epithelium of the respiratory tract and the antibody present in the blood is on the opposite side of this membrane, it is evident that spread of infection may be arrested by the antibody contained in inflammatory exudate. If the level of antibody in the serum is high it may overflow in sufficiently high concentration into the secretions that bathe the surface of the respiratory tract, and, thereby, prevent primary invasion of the susceptible epithelium by the influenza virus. Thus,

FIGURE 2



for antibody to be effective it must be present where it may come into intimate contact with the virus *before* invasion of the susceptible cells.

Specificity of the Immune Mechanism—Another important consideration for effective immunity against poliomyelitis and influenza, each of which is really a family of diseases, is the necessity for creating an antibody barrier for all immunologic varieties. This is illustrated in Figure 2 where it may be seen that the susceptible host will be spared the ravages of these diseases only if there is a solid wall consisting of antibody for each type of poliomyelitis virus and for each of the types and subtypes of influenza virus. For the control of poliomyelitis in this way, the problem may be relatively simple in that there appears to be a high degree of homogeneity within each type.

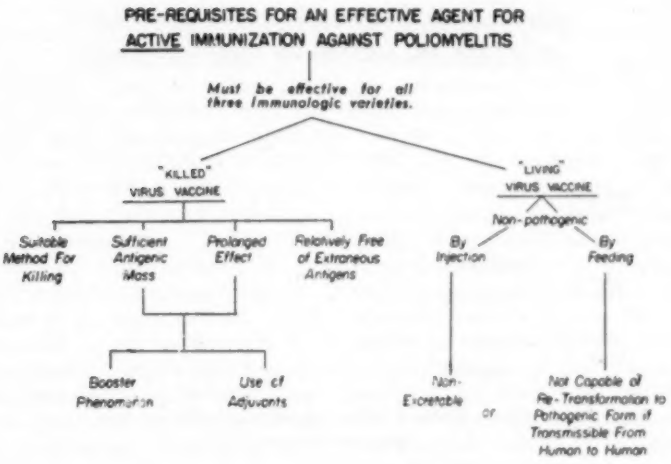
For influenza the problem is more complex in that there is a rather wide degree of heterogeneity, among type A strains, at least, the full extent of the variation of which is as yet unknown. The fact that influenza A epidemics occur more frequently than epidemics of influenza B—at intervals of two to three years as compared to five to seven years—may well be because of the greater degree of heterogeneity of the A varieties as compared with the B. The virus of influenza C, which has been recognized only recently, appears to be different in many respects from the viruses of influenza A and B. Although a member of the influenza family of viruses, the epidemiologic behavior of this agent is different from that of the other two viruses, and it is conceivable that immunologic homogeneity may be one reason for the apparent absence of influenza C as a major cause of periodic eruptions.

REQUIREMENTS FOR A POLIOMYELITIS VACCINE

It is clear from the foregoing illustrations that fundamental immunologic principles that apply equally well to influenza and poliomyelitis do so in different ways. Nevertheless, an approach which has been successful in part, and is being improved upon, for the control of influenza has served to facilitate the progress of the problem of immunization against poliomyelitis. Because this progress is so much less advanced, it is desirable to dwell briefly upon the essential requirements for a preparation that may be employed to induce immunity to poliomyelitis. A summary of prerequisites for the two principal approaches, either a killed-virus vaccine or a living-virus vaccine is presented in Figure 3.

The first consideration for a living virus vaccine is that it must be devoid

FIGURE 3



of the capacity to induce the paralyzing disease in man. Preparations containing live-virus may be administered either by feeding or by injection. If fed, it is likely that the agent will appear in secretions or excretions; under such circumstances the virus may be transmissible from man to man. It will be necessary, therefore, to be certain that the originally nonpathogenic virus is not capable of retransformation to the pathogenic form after undergoing human passage. If a living-virus vaccine is given by injection, the same prerequisites would apply if the virus, so administered, is found in the secretion of the oropharynx or in the contents of the bowel.

A killed-virus vaccine poses no problems of safety, with respect to the virus component, if treatment is carried out in a way which will destroy completely the capacity to multiply without impairing antigenic effectiveness. For this it is necessary that there be available a sufficiently rich source of virus relatively free of extraneous antigens, and that there is a reliably reproducible method for destroying infectivity without totally destroying antigenicity. Moreover, it would be desirable, from the practical viewpoint, that means be available for inducing an adequately prolonged effect and one that may be readily reinforced when needed.

The development of tissue culture methods for the propagation of poliomyelitis viruses has yielded preparations that are relatively free of extraneous antigens, and the solution to the problem of adequacy of antigenic mass is being approached rapidly by greater proficiency in cultivation of these viruses. The use of precise methods for studying the effect upon the virus of different methods of inactivation has provided a means, that is reproducible, for destroying infectivity without eliminating antigenicity. The problem of sufficiency of antigenic mass and adequate prolongation of immunizing effect can both be influenced by the application of the "booster phenomenon" and by the use of mineral oil adjuvants; both will be considered in more detail in the discussion to follow.

FIGURE 4

DISSOCIATION OF PARALYTOGENIC AND ANTIGENIC EFFECTS BY DILUTION AND INJECTION VIA A NON-NEURAL ROUTE

		Dilution of Tissue Culture Fluid					
		10^{0}	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}
MAHONEY (Type 1)	Paralysis	+	+	+	+	+	0
	Antigenicity	+	+	+	+	+	0
MEF-1 (Type 2)	Paralysis	+	0	0	0	0	0
	Antigenicity	+	+	+	+	+	0
SAUKETT (Type 3)	Paralysis	+	0	0	0	0	0
	Antigenicity	+	+	+	+	+	0

Studies in cynomolgus monkeys injected intramuscularly with fluids emulsified with mineral oil.

Although the approach of most investigators interested in the question of a live-virus vaccine for poliomyelitis is along lines that involve administration of such preparations by feeding, our interest in exploring this question has been limited to the *injection* rather than to the *feeding* of such preparations to experimental animals. In this way an attempt has been made to study the factors responsible for the subsequent occurrence of immunity, with or without paralysis, following the injection of live-virus. It is well known that differences exist among strains of poliomyelitis virus with respect to their virulence, or pathogenicity, when administered via the intracerebral route in monkeys.

Differences of even greater degree among strains have been observed in respect to their paralyzing effect when administered by a non-neural route. Figure 4 summarizes the results of a series of experiments designed to determine whether or not paralysis and antibody formation occur when cynomolgus monkeys are injected intramuscularly with different dilutions of tissue culture fluids containing selected strains of the three virus types. It is clearly evident from this chart that the Mahoney strain of type 1 virus is highly paralytogenic; even at the highest dilution that is capable of inducing antibody formation it is possible for paralysis to occur. For the MEF-1 and Saukett strains of types 2 and 3 virus, respectively, it appears that paralysis does not result from the injection even of large amounts of living virus. It may well be that differences in the characteristics of invasiveness for the central nervous system may be the reason for the difference in behavior of different strains. However, it is also conceivable that a longer incubation period for the MEF-1 and Saukett strains, as compared with Mahoney, may allow antibody to appear before the central nervous system is invaded. Although the reasons for the dissimilar behavior of these strains is not understood, that they are different is clear indeed.

The information presented in Figure 4 is not intended to suggest that all type 1 strains behave like Mahoney; in fact, this strain is unusual in this respect, and most other type 1 strains are similar to the types 2 and 3 viruses selected for

this illustration. Should the present attempts at developing a long-lasting immunity with a killed-virus vaccine fall short of expectations, it would seem highly probable that a procedure based upon the findings in Figure 4 may well succeed if strains are properly selected. This method has been under investigation for several years and it is possible to say that two years after inoculation antibody is present at an undiminished level from the peak obtained shortly after immunization of rhesus monkeys.

Because of the indeterminate risk attendant upon the use in man of a live-virus vaccine for a disease such as poliomyelitis, our principal attention has been directed toward exploring the possibility that a noninfectious preparation might be effective in preventing paralysis. The principal objective in these studies has been to determine the conditions required for inducing antibody formation in a consistent and reproducible manner. A second and longer range objective is to determine how antibody so formed may be made to persist or be capable of being recalled quickly and in sufficient concentration to be effective in preventing paralysis even if infection occurs at some time subsequent to immunization.

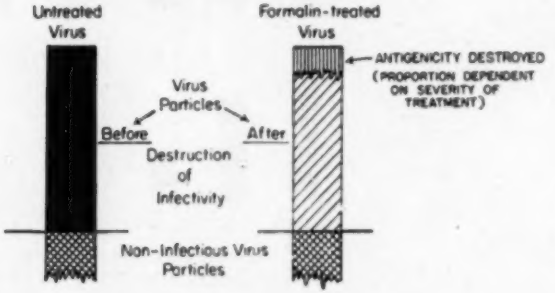
As indicated above, there are several prerequisites that must be satisfied before one should consider realistically the preparation of a noninfectious virus vaccine for poliomyelitis. Let us consider these in more detail.

Probable Existence of Occult Antigenic Material in Fluids from which Vaccines Are Made—One of the prerequisites that must be met is the availability of a sufficient mass of preformed virus to be effective in inducing antibody formation without requiring virus multiplication to provide the antigen needed for an adequate stimulus. The possibility that a sufficient concentration of virus was present in the available tissue culture fluids was based upon the concept illustrated diagrammatically in Figure 5. The solid black bar represents virus particles that are fully infectious; however, it is believed that in addition to virus particles capable of causing disease there are also present in such fluids, particles which may be noninfectious but which are still antigenic.

Several years ago the probable existence of virus particles capable of behaving in these two different ways was demonstrated in experiments employing suspensions of CNS tissue from para-

FIGURE 5

PROPORTION OF INFECTIOUS TO NON-INFECTIOUS VIRUS PARTICLES IN VIRUS SUSPENSION BEFORE AND AFTER TREATMENT WITH FORMALIN



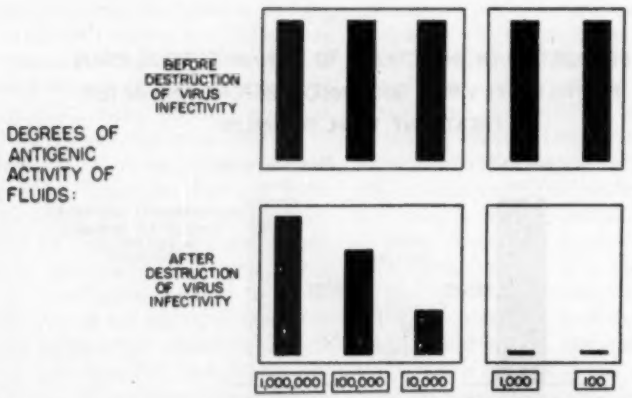
lyzed animals. Although we do not yet possess methods for direct measurement of the relative proportion of infectious and noninfectious virus particles in a mixture of the two varieties, it does appear that the preparations which have been employed in the course of our recent investigations in monkeys and in man have possessed a degree of antigenic activity greater than that which would have been anticipated on the assumption that no more than the amount of virus revealed by the most sensitive infectivity measurements was present. If this concept is valid, it would serve to explain, in part, why it has been possible to demonstrate the antigenic effectiveness of virus preparations which possess such relatively low infectious titers as compared with virus-containing fluids required for the preparation of vaccines for Japanese B encephalitis, influenza, and certain other virus diseases.

When the living virus preparation is treated chemically, the infectious activity is destroyed. Under such circumstances it is to be expected that the antigenic activity of both the infectious and the noninfectious particles might be impaired. Since the degree of destruction of antigenic activity would depend upon the severity of the chemical treatment, it would appear, as illustrated schematically in Figure 5, that the quantity of effective antigenic mass that remains after chemical treatment would depend upon two factors: (1) the total antigenic mass in the starting material, which consists of both infectious and noninfectious virus particles; and (2) the proportion of each that remains after chemical alteration for destruction of infectivity. The importance of both will be illustrated in the figures to follow.

The Importance of Antigenic Mass—The relationship which has been observed between virus concentration and

FIGURE 6

ILLUSTRATION OF RELATIONSHIP BETWEEN VIRUS CONCENTRATION AND DEGREE OF ANTIGENIC ACTIVITY OF FLUIDS CONTAINING POLIOMYELITIS VIRUS

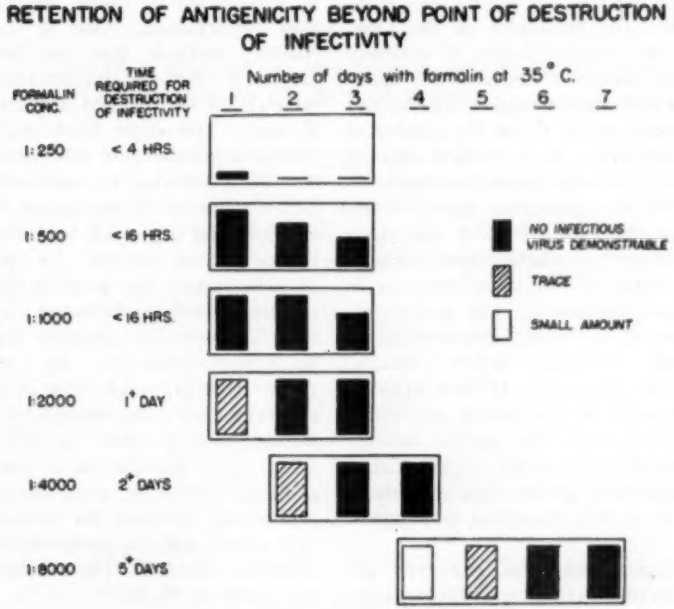


Estimated conc. of virus in fluid used for preparation of vaccine. (hypothetical no. of virus particles.)

degree of antigenic activity of fluids containing the poliomyelitis virus, before and after destruction of virus activity, is illustrated in Figure 6. The height of the vertical bars represents the degree of antigenic activity of vaccines prepared with different concentrations of virus. The numbers representing virus particles are hypothetical rather than actual and are based upon the approximate number of infectious units for tissue culture. Figure 6 has been divided into four frames: the two at the right illustrate the relationships that are observable when comparisons are made between living and dead virus preparations containing an antigenic mass too little to be effective without virus multiplication; the two frames at the left illustrate the effects observed with preparations of increasingly higher virus concentration after gentle treatment with formalin for destruction of infectivity. From the upper portion of the chart it is evident that infectious virus exerts a uniform antigenic effect. This is clearly the result of infection which, through virus multiplication, affords the full antigenic stimulus. The lower portion of the figure illustrates the gradation of effect resulting from injection of virus preparations which are not capable of multiplication; the response to such preparations can only be to the antigenic mass introduced in the inoculum.

Effect of Chemical Treatment Upon Antigenic Activity—A large number of experiments has been performed to define the optimal conditions for destruction of infectious activity, with maximal

FIGURE 7



Height of columns indicates approximations of degree of antigenic effect induced in monkeys with two doses of fluid emulsified with mineral oil.

FIGURE 8

RELATIONSHIP OF SIDE-EFFECTS TO COMPOSITION OF ADJUVANT MIXTURES

VIRUS IN SUSPENSION OF CNS TISSUE AND MINERAL OIL PREPARED AS AN EMULSION WITH	POTENTIATION OF ANTIBODY FORMATION	UNDESIRABLE LOCAL REACTION	ALLERGIC ENCEPHALOMYELITIS
Standard Arlacel A + Acid Fast Bacilli	++	++	++
Standard Arlacel A	+	±	0
Purified Arlacel A	+	0	0

retention of antigenic activity. The observations made are summarized in Figure 7. The concentration of formalin used for preparation of each experimental vaccine is indicated in the first column and the second column indicates the time required for destruction of infectivity; the remainder of the chart shows the relative degree of antibody response induced in monkeys with fluids treated with the different concentrations of formalin at 35° C. for the number of days indicated. It is evident that an excess of formalin destroys antigenicity and that an appreciable margin exists between the time at which infectivity is destroyed completely and antigenicity begins to be diminished, or is destroyed completely. This is true only if there is sufficient concentration of antigenic substance before chemical treatment is applied. If the concentration of virus in the starting material is inadequate, then the margin between destruction of infectivity and elimination of antigenicity is narrowed or reduced entirely, as was illustrated in Figure 6.

USE OF A MINERAL OIL ADJUVANT FOR ENHANCING ANTIGENIC EFFECTIVENESS

The need has long been recognized for a method of enhancing the immunizing effect of vaccine preparations that are of borderline effectiveness and for prolonging the effect of those that are of established value. It is for this reason that considerable attention has been devoted by many investigators to an exploration of means whereby this may be achieved. One of the most effective methods that has been employed is that of emulsification with mineral oil, as devised by Dr. Jules Freund. The single hindrance to the clinical applicability of this phenomenon was the occurrence of undesirable side effects at the site of inoculation. It seems that it should be possible to obviate these in one way or another. In the course of investigating the possible usefulness of this method for influenza virus vaccines, considerable progress has been made toward this end. As a result of rather extensive experience in animals, and even more extensive observations in human subjects—now including more than 30,000 persons—it is possible to present, tentatively, a summary of the relationship between the occurrence of side effects and the composition of the adjuvant mixture. These relationships are shown in Figure 8.

To those who have worked with emulsified vaccines it is well known that the

original Freund adjuvant mixture, which contained acid-fast bacilli, produces marked potentiation of antibody formation but it also produces marked local reactions, and if the emulsion contains CNS tissue a demyelinating encephalomyelitis will also result. However, when acid-fast bacilli are omitted from the emulsion mixture, there is potentiation of antibody formation which is somewhat less marked than with the acid-fast organisms; undesirable local reactions may or may not occur, and the CNS tissue without the acid-fast bacilli has not produced encephalomyelitis in more than a thousand monkeys inoculated repeatedly with such mixtures. Thus, the omission of the acid-fast bacilli appears to eliminate the risk of organ-damage or autosensitization to tissue that might be present in the vaccine mixture. Further studies have revealed that by purification of the emulsifying agent potentiation of antibody formation is still retained and undesirable local reactions appear to have been eliminated. With such preparations it will now be possible to explore the application of this principle further to determine whether or not any hidden and as yet unobserved pitfalls exist in the utilization of this highly efficient method for enhancing and prolonging antibody formation.

Dr. Freund had shown that various antigens emulsified with mineral oil in a water-in-oil emulsion, with or without acid-fast bacilli, will enhance the height and persistence of antibody formation. In our studies employing this phenomenon, using influenza virus vaccines both in experimental animals and in man, it has been found that quantities of antigenic material that are ineffective when administered as an aqueous preparation are substantially effective when properly emulsified (Figure 9).

FIGURE 9

ANTIBODY RESPONSE TO DIMINISHING QUANTITIES OF INFLUENZA VIRUS VACCINE EMULSIFIED WITH MINERAL OIL OR IN SALINE

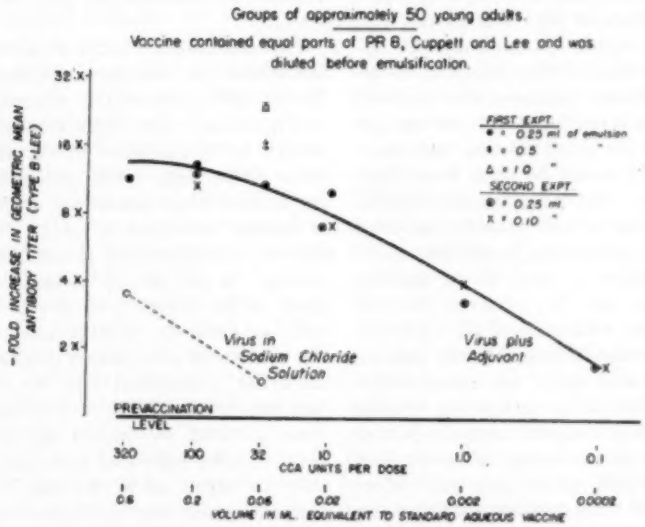
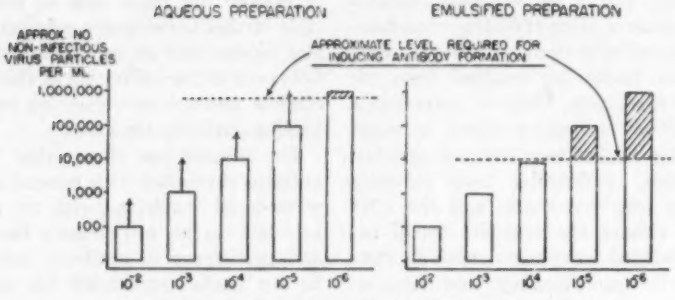


FIGURE 10

QUANTITY OF VIRUS REQUIRED FOR PREPARATION OF A NON-INFECTIOUS VACCINE



Infectious Titer of Tissue Culture Fluids Used For The Preparation of A Non-Infectious Vaccine

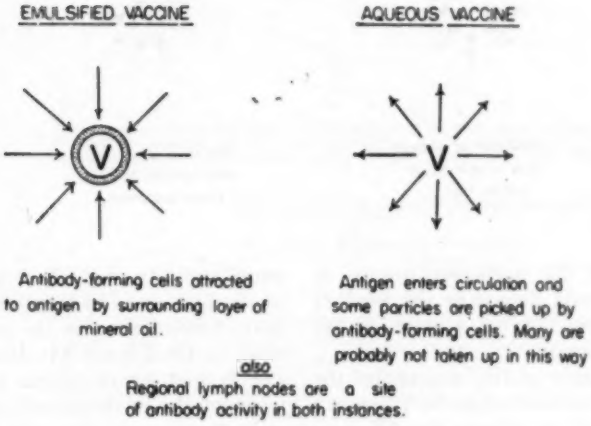
† *Indicates limits of practicable range of further conc of virus that it is possible to achieve by physical or chemical methods.*

This observation has been extended in studies with poliomyelitis virus vaccines and Figure 10 illustrates, perhaps in not too simple a fashion, the difference between the quantity of virus required for the preparation of a noninfectious vaccine both with, and without, emulsification with mineral oil. The dotted line, situated at two levels, indicates the approximate level of virus required for inducing antibody formation if an aqueous preparation is employed or if the antigen is fortified by emulsification with mineral oil. It should be clear from these relationships that preparations of poliomyelitis virus as well as influenza virus which may contain an insufficient quantity of antigen if used as an aqueous preparation may be rendered effective if emulsified with mineral oil. The arrows above the vertical columns indicate the practicable limits for concentration of virus that it is possible to achieve by physical or chemical methods. Other approaches for increasing antigenic mass which are still to be explored, before the limits of virus concentration that can be achieved are established, involve manipulation of the system in which virus multiplication takes place. Thus, as an adjunct to methods which will provide a sufficient antigenic mass for an effective vaccine, it appears that emulsification with mineral oil may be most useful.

The mechanism for the improved effectiveness of vaccines emulsified in mineral oil is illustrated schematically in Figure 11. The virus emulsified in mineral oil is contained in the aqueous phase of the water-in-oil emulsion; thus the antigen is surrounded by a thin film of mineral oil which attracts cells that appear to be important in antibody formation. In this way the antigen is more likely to be brought into direct contact with an antibody forming cell than is the antigen in an aqueous preparation; the latter is absorbed into the circulation and distributed in such a way that some particles are picked up by antibody forming cells and many are probably not taken up in this way. Thus, it would appear that apart from creating

FIGURE 11

RELATIONSHIP OF ANTIBODY FORMING CELLS TO VIRUS EMULSIFIED WITH MINERAL OIL OR TO VIRUS IN AN AQUEOUS MENSTRUUM


EMULSIFIED VACCINE
AQUEOUS VACCINE
V
V
Antibody-forming cells attracted to antigen by surrounding layer of mineral oil.
Antigen enters circulation and some particles are picked up by antibody-forming cells. Many are probably not taken up in this way
also
Regional lymph nodes are a site of antibody activity in both instances.

what might be referred to as an antibody forming organ at the site of inoculation, there is a more efficient utilization of the injected antigen.

The efficiency of utilization of the injected antigen is further enhanced by the elimination from the inoculum of extraneous antigenic constituents which have characterized most virus vaccines prepared from tissue suspensions. Experimental verification of this has been obtained with many systems and has been further substantiated in our studies with influenza virus vaccines and poliomyelitis virus vaccines emulsified with mineral oil adjuvants. Figure 12 illustrates schematically how direct contact between antibody forming cells and virus particles are possible with suspensions of relatively pure virus in tissue culture fluids; whereas a mixture of virus and other particles in crude tissue suspensions result in a competition between the specific virus and other particles for space in the antibody forming system.

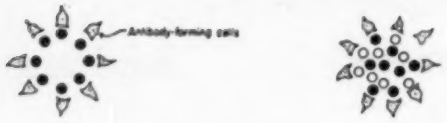
In addition to the emulsification increasing the efficiency of utilization of the injected antigen, there is an advantage in the increased antibody levels which are not readily attainable with the aqueous antigen and the advantage of greater persistence of antibody. Whether or not these benefits can be utilized will depend upon the continued favorable clinical observations following the inoculation of emulsions made with purified reagents.

PERSISTENCE OF CLINICAL IMMUNITY

If it is assumed that clinical immunity is linked, in part, to the level of serum antibody, then it would follow that the interval through which antibody is present in an amount above a critical threshold would determine the length of time that immunity will persist. A priori, it would appear that the mode of path-

FIGURE 12

MECHANISM OF INTERFERENCE WITH ANTIBODY FORMATION FOR A SPECIFIC VIRUS BY PRESENCE OF EXTRANEOUS TISSUE ANTIGENS



Suspension of relatively pure virus in tissue culture fluid

Mixture of virus and other particles in crude tissue suspension

ogenesis of the particular disease in question would determine the level of antibody required for a state of immunity to prevail.

On the basis of this assumption the schematic representations in Figure 13 are presented to indicate the difference in the level of antibody required for a disease in which virus is transported via the blood stream to the central nervous system or directly invades the susceptible cells of the respiratory tract, in influenza, or of the nervous system, in poliomyelitis. If the pathogenesis of paralytic poliomyelitis is via the blood stream, then relatively small quantities of antibody would be necessary to intercept the virus before invasion of the central nervous system. On the other hand, if the virus of poliomyelitis is transported from the portal of entry to the central nervous system directly over nerve pathways, it would be necessary that there be present higher levels of antibody in the circulating blood, sufficient to overflow into the perineural channels and perhaps intercept virus invasion in that way.

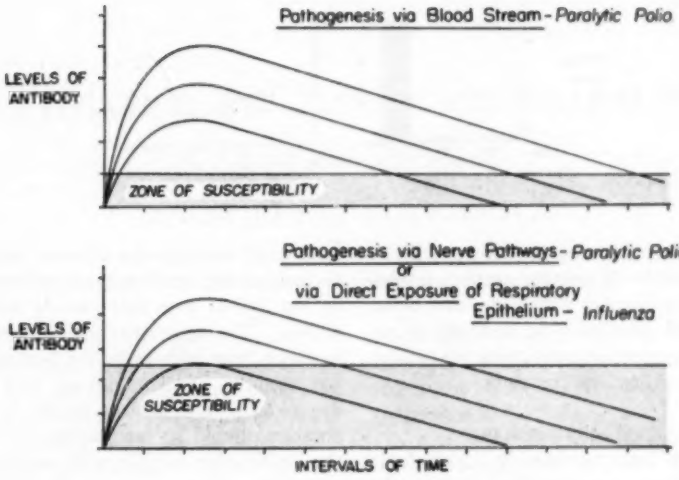
The pathogenesis of influenza in relation to the way in which antibody might be effective would resemble the latter example for poliomyelitis. The level of serum antibody would have to be sufficiently high so as to be present in adequate concentration in the nasal secretions, as Dr. Francis has demonstrated, and in this way only can it serve to intercept the establishment of infection and disease. If the persistence of clinical immunity is related to the degree of persistence of serum antibody, it would follow also, from what is known about rate of antibody decline following immunization, that it would be influenced by the level to which antibody is raised initially. Thus, it should be possible to predict the probable duration of immunity from studies on the height to which antibody level is raised and the general course of its decline over a period of months after inoculation.

Although the assumption has been made that persistence of immunity is related to the presence of circulating antibody, it is well known that once an individual has been exposed to a particular antigen he will, on a subsequent occasion, react much more promptly with a great abundance of antibody and do so in response to much smaller amounts of antigen, than he did at the time of his first exposure.

Dr. Colin MacLeod, in his presidential address before the American Association

FIGURE 13

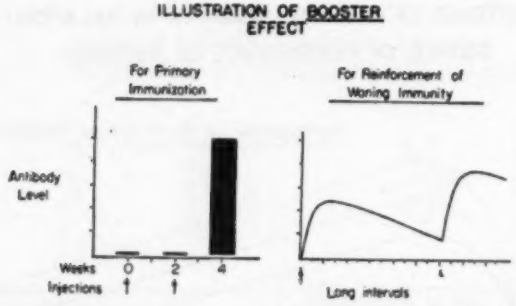
PERSISTENCE OF CLINICAL IMMUNITY IN RELATION TO DEGREE OF PERSISTENCE OF ANTIBODY


Pathogenesis via Blood Stream - Paralytic Polio
LEVELS OF ANTIBODY
ZONE OF SUSCEPTIBILITY
Pathogenesis via Nerve Pathways - Paralytic Polio
or
via Direct Exposure of Respiratory Epithelium - Influenza
LEVELS OF ANTIBODY
ZONE OF SUSCEPTIBILITY
INTERVALS OF TIME

of Immunologists in 1952, presented an attractive theory to explain the presence or absence of lifelong immunity on the basis of the length of incubation period for the disease in question. He has postulated that the second attack of disease will be prevented, even in the absence of neutralizing antibody at the time of exposure, if the incubation period is longer than the three to seven days required for the "booster" response to the second antigenic stimulus. He has suggested also that the reason for the relatively short-lived immunity to such diseases as the common cold and influenza may be due to the decline in level of antibody with a return of the state of relative susceptibility which is not rapidly enough reinforced by the new exposure because of the shortness of the incubation period. Whether or not this phenomenon may be operative in producing what appears to be lifelong immunity to poliomyelitis, and may influence the persistence of immunity following artificial primary immunization, remains to be determined.

Nevertheless, sufficient information has been gathered in the course of our studies with poliomyelitis vaccines, both in experimental animals and in human subjects, to indicate that substantial levels of antibody can be induced if multiple inoculations are given for primary immunization and, furthermore, that on the declining limb of the antibody curve indicating waning immunity, inoculation of relatively small amounts of antigen is capable of calling forth very substantial levels of antibody. This is illustrated schematically in Figure 14. It would appear that for poliomyelitis the booster effect, with or without the mineral oil adjuvant, might well serve as a means for enhancing the efficiency of primary immunization and for rein-

FIGURE 14



forcement of waning immunity. Thus, poliomyelitis, in another respect resembles other diseases which are now being controlled effectively by methods of active immunization employing toxoids or other noninfectious antigens.

CONCLUDING REMARKS

I have tried to show in a schematic and, perhaps, oversimplified fashion the way in which the well established principles of immunology may be applied to the development of active immunizing agents for the control of influenza and poliomyelitis. The experimental evidence that has permitted the illustrations drawn, has been published in part, but many unreported data are represented in the charts presented here.

The question, for a long time, has not been what needs to be done to develop an immunizing agent against poliomyelitis but rather *how this can be accomplished*. The answer to the first question has long been with us in the heritage of the sciences of immunology and epidemiology. The answer to the second question should be forthcoming through the application of the well established principles of these sciences. By utilizing the experience accumulated in the study of other diseases in which progress is further advanced, the solution to the problems that remain will be hastened. But, only through a synthesis of the ways of the laboratory investigator in the immediate and related fields of the clinical investigator and of the epidemiologist will the solution to the problem of poliomyelitis be forthcoming.

Sufficient to reveal this paper's flavor is one quotation from it: "There are good enough reasons to suspect that our present high-fat diet in the United States is scarcely favorable to the health of adult men, even though it is premature to blame it as the whole cause of our excessive mortality from heart disease."

Prediction and Possible Prevention of Coronary Disease*

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THE problems of diagnosis and of management of coronary heart disease are so numerous and important that great efforts should be made toward their solution, but several limitations must be recognized. From all the available evidence there is no reason to hope that coronary heart disease can ever actually be cured in the sense that a cancer may be "cured" by surgical excision, or even that tuberculosis may be permanently arrested. Moreover, there is some reason to doubt whether, at present, early diagnosis of coronary heart disease will greatly change the eventual prognosis.

The basic lesion in almost all cases of coronary heart disease is the deposit of lipid materials in the walls of the coronary arteries. Once thoroughly established, these atherosclerotic deposits are nearly, or perhaps totally, irreversible. The real focus of attention for the control of coronary heart disease must be the problem of preventing these deposits from developing further. An essential part of this problem is the question of predicting the threat of coronary disease, which is pretty much the same thing as recognizing the tendency of atherosclerosis to progress.

Not so long ago it was widely held that arteriosclerosis, and the particular variety called atherosclerosis, was an essential part of aging. The result was a defeatist attitude and a regrettable lack of research interest. Now, however, it is clear that age alone does not bring with it the cholesterol deposits in the arteries that currently constitute the basic cause of more deaths in the United States than any other disease category.

Atherosclerosis is a progressive development and it seems highly probable that the eventual appearance of clinical coronary disease usually represents the cumulative effect of a factor, or factors, operating over a period of years. Age, per se, is certainly not the cause, as is evident from the great variations between individuals of the same age in spite of a general *average* progression with age.[1, 2] Many factors are probably involved in the atherosclerotic development and in the clinical appearance of coronary heart disease, but there is no longer any doubt that one central item is the concentration, over time,

* Address presented at the Annual Health Conference of New York at Lake Placid, N. Y., June 3, 1953.

of cholesterol and related lipids and lipoproteins in the blood serum.[3-7] No other etiological influence of comparable importance is as yet identified.

At this point, however, controversy begins about the particular substances in the blood that are most significant in this regard. Detailed arguments about the relative merits of different blood analyses for the recognition or prediction of coronary disease are not essential to the present discussion.[8-12] It is clear enough that total cholesterol, free cholesterol, phospholipids, beta lipoproteins, and the lipoproteins of various sizes and densities as they can be separated in the ultracentrifuge are all intimately interrelated and that none, by itself, affords a safe basis for prediction about the disease process in the individual. There is no doubt that of the several different analytical methods for recognizing these substances each may yield averages that differentiate, statistically, between *groups* of patients with clinical coronary disease and *groups* of clinically healthy persons who are otherwise comparable. From the evidence so far available, it is not possible to accept the claim of Gofman and his colleagues in California for the remarkable virtue of the ultracentrifuge in this regard. At this point a word of caution is appropriate to guard against the overinterpretation of any of these laboratory data for particular patients.

The argument for giving a prime place to the total blood serum cholesterol in any consideration of the public health aspects of these problems is simple. As a discriminator between coronary patients and their healthy counterparts, the total cholesterol measurement seems to have much the same value as some other measurements (e.g., lipoprotein fractionation, ultracentrifugation); it is not claimed to be appreciably better. It has, however, a considerable practical advantage because the relatively simple cholesterol method is far more suitable for large-scale application and there is much more knowledge about it. Moreover, it should not be forgotten that cholesterol itself is the main intruder in the actual lesions of the coronary arteries. This cholesterol comes from the blood.

As will be seen, the cholesterol level in the blood (and the level of the related lipoproteins) can be influenced by the diet, both in man and in some animal species. However, the situation has been greatly confused by too much reliance on experiments with animal species differing from man in cholesterol metabolism. Adding equal amounts of cholesterol itself to the diet produces widely different results in the several species studied so far, the rabbit and the chicken being at one extreme, while man, the dog, and probably the monkey are at another and opposite extreme.[12] Atherosclerosis may be readily produced in the rabbit and in the chicken by feeding a diet containing large amounts of added cholesterol.[13] There is no doubt that the resulting arterial deposits of cholesterol are directly related to the concentration of cholesterol in the blood which rises to great heights in these species, while feeding cholesterol to man, or to the monkey, has very little effect on the blood even when enormous doses of cholesterol are given.[12-15]

The cholesterol-fortified diet commonly used to produce hypercholesterolemia and subsequent atherosclerosis in the rabbit contains 1–5 per cent of added cholesterol. A 2 per cent cholesterol diet for the rabbit, which is most commonly used, corresponds to about 15 gm. of cholesterol in a 3,000-calorie diet for a man. Such an amount of cholesterol is fantastically far above anything that occurs in any natural human diet, the upper limit of the latter being of the order of 1 gm. in 3,000 calories. Even when concentrating on foods of naturally very high cholesterol content, it is

difficult to devise a regular diet to provide, experimentally, as much as 2 gm. of cholesterol in the daily diet.[16-18]

That dietary cholesterol is not important for man would be predicted from the fact that the biliary output of cholesterol from the human liver is from 10 to 20 times as much as the daily amount of cholesterol in any diet of natural foods. Repeated careful dietary surveys on large numbers of persons in whom blood cholesterol was measured consistently fail to disclose a relationship between the cholesterol in the diet and in the serum.[19-21] Infants and children, as well as adults, show this lack of dependence of serum content upon the exogenous supply of cholesterol,[22] but this does not mean that the diet is unimportant in regard to the blood cholesterol. Controlled experiments on men clearly show that serum cholesterol changes in direct relation to a change in the total amount of fat in the diet.[7, 23-25] Both animal and vegetable fats show this effect and the addition or removal of cholesterol in the diet does not change the result. The blood cholesterol may fall, however, if the diet is almost exclusively pure fat and is free of carbohydrate;[26] this highly artificial experiment would seem to have no relevance to natural situations.

Now this being the case in controlled experiments limited to a few months' duration, it is important to discover what may be the situation where there are lifelong differences in the amount of fat in the diet. Moreover, the controlled experiments so far have been limited to individuals who have previously always subsisted on a relatively high-fat diet.

The fact of the matter is that practically all Americans in modern times eat a relatively high-fat diet. Forty years ago the fat calories averaged slightly over 30 per cent of the total and at present, on the average, fats provide over 40 per cent of the total calories in the foods sold at the retail level in the United States.[27, 28]

No other country appears to match this level of fat consumption, the next highest values, with fats providing from 38 to 39 per cent of the calories, being in Australia, New Zealand, and Canada. From 30 to 35 per cent of the total calories come from fats in the United Kingdom, the Netherlands, and the Scandinavian countries. Far lower fat consumption is characteristic of Italy, Portugal, and Spain where, on the average, the total fats cover only some 19–23 per cent of the total calories. Even lower values are found in parts of Latin America, while the smallest percentage of fat calories in the total, 10 per cent or less, is found in Asia and Africa.

Before examining blood cholesterol data obtained in other countries, it is essential to consider the situation in the United States. Normative data for the urban "white collar" class have been provided by several thousand clinically healthy men in Minnesota,[29] and the findings are in good agreement with other smaller series studied elsewhere in American cities.[8, 30-32] The main features of these data are a marked curvilinear age trend and a considerable variation between individuals at any given age. The mean value for men aged 20 is about 180 mg. of total cholesterol per 100 ml. of serum and this tends to rise more or less linearly with age until around 50 years, the means from 50 to 60 years of age are about 260 mg.; in very old persons low values predominate. This age trend in serum cholesterol is very similar to the findings on the incidence of marked atherosclerosis at autopsy.[1, 33]

These characteristics of clinically healthy men in American cities are to be compared with recent findings in Italy, England, and Spain.[12, 33-35] The first of these comparative studies was begun in Naples in 1952, where the gen-

TABLE 1

Mean Serum Total Cholesterol Concentration, in mg. per 100 ml., in Clinically Healthy Men in Naples, London, and Two Classes of Spaniards. All Values Here Pertain to the Nonbasal State and Therefore Are Not Precisely Comparable to the Basal Norms for Minnesota.

Age	Naples	London	Spaniards	
			Poor	Rich
20	185	187	181	202
30	216	205	215	217
40	231	248	223	243
50	229	255	210	264

eral average of the diets, both of the whole population and of the particular men studied, was about 20 per cent of calories from all fats.

The serum cholesterol values showed that the Minnesota and Neapolitan trends are not significantly different in youth but around age 30 they begin to diverge. In the fifties the Minnesota men averaged 40–50 mg. per cent higher than the Neapolitans. In this respect, the Italian men are not aging like the Americans who have been studied. It might be asked whether this difference is related to relative obesity in the two countries. Actual measurements, however, showed that our Italian subjects were just about as fat as our Minnesotans as gauged both by relative body weights and by measurements of the thickness of subcutaneous fat.

This finding has extraordinarily interesting connotations and it is important to check it with other populations. Opportunity to do this was found in Spain. Our main series of Madrid subjects, in 105 poor families, was found to be characterized by subsistence on a diet low in both fats and total calories. These men were, on the average, much thinner than either the Minnesotans or the Italians, but in serum cholesterol they closely resembled the latter. Again, when comparison was made with the United States, the correspondence in youth and the divergence after age 30 was striking. In the fifties these Madrid men averaged over 50 mg. lower than the Minnesotans.

In Spain the great majority of the population is poor and subsists on a low-fat, low-calorie diet. The small wealthy and professional class, racially identical, lives on a diet at least as luxurious, and as high in fats and in calories, as in the United States. Study of a sample of clinically healthy men of this class in Madrid showed them to be very similar to the Minnesota men in regard both to body fatness and to serum cholesterol concentration. There was, then, a striking difference between the poor and the relatively rich Spaniards, as indicated in Tables 1 and 2.

Finally, it was possible to study a sample of clinically healthy men in the

TABLE 2

Mean Serum Total Cholesterol Concentrations at Ages 30–55 in the Several Populations of Clinically Healthy Men, Expressed for Each Population as a Percentage of the Mean Value at Age 30.

Age	Minnesota	Naples	London	Madrid	
				Poor	Rich
30	100	100	100	100	100
40	112	107	121	103	112
50	127	106	124	98	122
55	131	109	127	100	127

London area of England. These men were found to be, on the average, considerably thinner than the Minnesotans, the Neapolitans, or the rich Spaniards. Their diets, studied individually in a careful survey, averaged 35 per cent of all calories in the form of fats—that is to say much more like the diets of the Minnesotans and rich Spaniards than the diets of the Neapolitans or poor Spaniards. The mean serum cholesterol values for these Englishmen are given in Table 1. The relative trends from age 30, given in Table 2, most precisely indicate the differences in the populations. Clearly, the whole series of data suggests that the serum cholesterol concentration and its age trend is primarily related to the fat content of the diet but not to the body fatness. So far, then, the picture is that the serum cholesterol is more or less independent of the diet in youth but that progressively after about 30 years of age the serum level is directly related to the total fats in the diet. The effect of obesity itself is apparently not so important, although in each population we found a small correlation between obesity and serum cholesterol. The next question is whether all this is related to the incidence and mortality from coronary and related heart disease.

For Spain we can only say that coronary heart disease is strikingly uncommon in the general population as surveyed in the hospitals and public clinics. There were, however, many cases among the wealthy patients of our friends, the fashionable practitioners. Unfortunately, Spanish vital statistics are either practically nonexistent or are relatively unreliable, so that it is impossible to cite valid figures for mortality specific for age and sex. For some other countries, however, comparable statistics are available, both for death rates and for national diets, and these prove to be extremely interesting.

Table 3 summarizes the death rates for men aged 40–44 and 50–54 ascribed to all circulatory diseases and to what may be termed "degenerative heart disease," predominately coronary heart disease, as computed from official statistics for 1948–1949 in several countries. Taken at face value, there is indicated a tremendous range from the figures for white men in the United States to Japanese men. For the age range 50 through 54 years, these data indicate that the death rate from coronary heart disease and allied myocardial disorder in the United States is more than four times that of Italian men and over 10 times that of Japanese men of the same age.

Broadly speaking, death rates as-

TABLE 3

Deaths of Men in 1948–1949, Rates per 1,000 of Given Age, Ascribed to All Circulatory Diseases (International Category VII) and to Degenerative Heart Diseases (Myocardial Diseases and Coronary Heart Disease, Categories 93 and 94 in the International List of 1938).

Category	All Circulatory Diseases		Degenerative Heart	
	40–44	50–54	40–44	50–54
U. S. Whites	1.66	5.65	1.19	4.44
Canada	1.10	4.03	0.89	3.43
" , % U. S.	66%	71%	75%	77%
England and Wales	0.70	2.73	0.27	2.04
" " " , % U. S.	42%	48%	22%	46%
Italy	0.63	1.86	0.25	1.02
" , % U. S.	38%	33%	21%	23%
Japan	0.55	1.25	0.14	0.37
" , % U. S.	33%	22%	12%	8%

TABLE 4

Death Rates, from All Causes, in 17 Countries with a Total Population of About 310 Millions. All Values Are for the Period 1947–1949 and Are Expressed as Percentages of the Corresponding Rates in the United States in 1949.

Age	*40–44*		*50–54*		*60–64*	
Sex	*M*	*F*	*M*	*F*	*M*	*F*
Australia	75	91	87	96	94	94
Belgium	96	89	91	96	97	101
Canada	78	91	76	92	84	96
Denmark	59	83	63	88	70	100
England and Wales	68	78	76	83	93	88
France	96	100	91	91	93	91
Ireland	80	78	57	86	69	88
Italy	91	100	77	88	75	97
Japan	156	216	111	153	113	207
Netherlands	52	69	56	76	63	89
New Zealand	55	72	66	81	85	88
Norway	64	78	53	65	54	68
Portugal	139	125	99	96	99	103
Scotland	93	97	93	100	97	107
South Africa	93	108	102	115	94	104
Sweden	61	86	63	85	68	92
Switzerland	78	97	78	97	88	108
Mean	84.3	97.5	78.8	93.4	84.5	101.1

cribed to specific causes are not very reliable under the best of circumstances. Certainly it would be difficult to insist that the values in Table 3 for "degenerative heart disease" in the different countries are strictly comparable nor would it be reasonable to suggest that the values listed for all circulatory diseases are actually precise. Yet we are not dealing here with the minutiae of differential diagnosis of relatively rare diseases. Can it be suggested seriously that in Canada a third of the deaths from circulatory diseases are missed? Or, conversely, that in the United States many thousands of death certificates for relatively young men are each year falsely or erroneously labeled with one or another variety of circulatory disorder when the proper label should have been pneumonia or tuberculosis or some other cause in a completely unrelated category? It should be observed that in 1949 over one-third of all deaths of white men from 40 through 44 years of age were ascribed to circulatory diseases. To bring the rate down to the Italian or Japanese level would require either the assumption that the great majority of circulatory disease deaths reported in the United States actually were due to other causes or that in Italy and Japan only one-fourth to one-tenth of the true circulatory disease deaths were recognized as such.

It is useful to shift the focus to the total death rate from all causes, retaining, of course, the essential specification of age and sex. Table 4 assembles such information for 17 countries for the period 1947–1949, expressed as percentages of the corresponding death rates in the United States in 1949. For the countries listed, these rates for deaths from all causes are, presumably, not subject to large errors.

The outstanding feature of Table 4 is that it shows the mortality from all causes to be surprisingly high in the United States, in comparison with other countries, for adults in this range of from 40 to 65 years of age. The relative inferiority of "health," as indicated by the death rate of the American male

is particularly marked. Only Japan and Portugal have poorer records, and in these countries the high incidence of infective and parasitic diseases explains the high total mortality. The explanation of the high mortality among adult American males is, of course, ready at hand—excessive mortality from heart disease.

The improvement of vital statistics recording, and the accuracy of the death certificates on which they are based, has now reached the point in many countries where detailed analysis is rewarding. Such work is in progress in the Laboratory of Physiological Hygiene and the results are of much interest. For example, we find that when we compare the data for men of equal ages in the United States and in Italy we find substantially the same values in the two countries for the ages 40–60 for all neoplasms, for cirrhosis of the liver, for nephritis and nephrosis, and for intracranial lesions of vascular origin. Among major causes of death, in fact, only the death rates ascribed to heart diseases are grossly dissimilar. Why? Further analysis of the death rates from all circulatory disorders shows that when the degenerative group of coronary disease, angina pectoris and myocardial disease are excluded, the death rates from the total of all *other* circulatory diseases are much alike in the two countries. Why? From every viewpoint the analysis brings us back to the conclusion that there is a major difference between these countries for the incidence and mortality of coronary heart disease. This problem is greatest among American men and tends to become progressively less as we pass to countries where fats contribute less and less to the total diet. As far as data have been made available, the blood cholesterol picture in the clinically healthy members of the populations are entirely in keeping with the dietary and the mortality data.

It should be recognized that, in addition to the character of the diet, another factor may possibly be involved. Differences in habitual physical activity cannot be ruled out of the picture since, in general, the population groups on the lower fat diets are also characterized by a higher level of physical activity. Special studies on this point are already in progress.

Let us now return to the diet. There are enough good reasons to suspect that our present high-fat diet in the United States is scarcely favorable to the health of adult men, even though it is premature to blame it as the whole cause of our excessive mortality from heart disease. The changes in mortality in countries forced to alter their diets during the late World War cannot be ignored. These changes conform to the concept that the proportion of fat in the diet is closely related to the development of arteriosclerotic heart disease.[36-38] Changes in diabetes mortality among patients over 45 years of age, notoriously related to atherosclerosis, were equally marked during the war and the parallel with the dietary change is equally striking.[39, 40]

From the start of acceptable systematic records of the U. S. Department of Agriculture in 1909, the proportion of fats in the national food supply has steadily risen from roughly 30 per cent of total calories to over 40 per cent in 1950–1952. The same data indicate that the protein contribution to the total calories has remained substantially constant at around 12 per cent, or a trifle less. Because of the uncertainties in regard to kitchen and plate waste, the actual intake of the several major nutrients cannot be specified with great precision; but there is no doubt that the per capita consumption of total fats in the United States is higher than anywhere else and it has been, and still is, steadily rising. In view of the facts and concepts expressed above, this consti-

tutes a real problem for the public health.

Among other immediate questions that arise is that of the several sources of the fats in the present national dietary. In the classification of the U. S. Department of Agriculture, by far the largest proportion of the total fats, from 45 to 50 per cent in recent years, is "fats and oils as such, excluding butter." This means cooking and salad fats and oils—lard, corn oil, cottonseed oil, hydrogenated vegetable oil shortening, margarine, mayonnaise, etc. Butter contributes about 5 per cent of the total fat calories. It is evident that a large reduction in our present high-fat consumption could be achieved without affecting the fats associated with the more nutritionally valuable foodstuffs. In other words, it should not be difficult to reduce the total fat intake and still have a diet excellent in all other respects.

In this discussion I have attempted to present some salient features of a large and complex problem. The evidence is drawn from many fields but the whole provides, I believe, a consistent and important basis for further studies and perhaps major public health attention. The focus is on men from age 30 to age 70. About women we know much less, but the coronary heart disease problem is apparently less important for them until later in life. Women, too, are eventually less than immortal, and their death rate from degenerative heart disease is high in the United States, the chief peculiarity being a later age of onset than that for men. From a study of vital statistics it appears that women are less prone to suffer from angina pectoris and sudden fatal coronary occlusion, a less spectacular, chronic development, leading to a diagnosis of chronic myocarditis or myocardial degeneration, being the rule. Finally, the effect of habitual differences in the level of physical activity has scarcely received any research attention. These and many other questions can and should be clarified by extensive and critical epidemiological studies.

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National Science Foundation Announces Fellowships

The National Science Foundation has announced its fellowships for the academic year 1954–1955. It will award about 750 graduate and postdoctoral fellowships to persons planning to undertake study during the coming academic year in the biological, engineering, mathematical, medical, or physical sciences. Depending on the academic status of candidates, stipends range from $1,400 to $3,400 annually, plus dependency and travel allowance, tuition, and laboratory fees.

Postdoctoral applications must be received in the Fellowship Office by December 15, 1953; graduate applications by January 4, 1954. Applications should be accompanied by copies of college transcripts and a plan of study for advanced training. The official announcement, application blanks, and further information from The Fellowship Office, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C.

Military emergencies rendered malaria control virtually impossible during the early months of the Korean venture and, as a consequence, there was a great deal of malaria. It is not likely, however, that returning troops will constitute much of a public health hazard from the malaria standpoint or from that of any other disease.

Local Health Hazards Among U. S. Army Troops Returning from Korea

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AS the late Major General E. E. Hume, medical director of the United Nations' Forces in Korea, pointed out, the Korean campaign differs in many respects from any war heretofore waged by any of the United Nations. For example, the climate of Korea runs to extremes, for it is subtropical in the summer and arctic in the winter. Actually, it is one of the coldest climates in which Americans have ever fought. Furthermore, many diseases occur in Korea to a greater extent than elsewhere; while the forbidding terrain, the grossly infested soil and water, as well as the general distress of the population have combined to create a background for medical and even surgical conditions without comparison in the countries from which the UN soldiers have come.

Colonel A. P. Long, until recently the preventive medicine consultant, General Headquarters, Far East Command, has pointed out [1] that the prevention of the occurrence of disease and injuries "is the function and purpose of military preventive medicine. . . .

"The basic disease problems arising in the Far East Command are not significantly unlike those experienced in the various parts of the United States, the difference frequently being quantitative rather than qualitative. Thus the procedures applicable for disease prevention at home are also to be applied in the Far Eastern areas, the principal difference in their application being the increased vigor and attention that are frequently required. In addition to these basic health problems demanding constant attention, there are certain conditions and disease hazards which, though not necessarily unique to the Far East, differ from those seen in the United States, and hence offer new experiences in prevention and management of disease to the American trained physician."

It is believed that by examining the diseases found among UN troops in general, and the United States soldiers in particular, a fairly good estimate can be made of the over-all situation. In this way some idea can be gained of what may be anticipated in U. S. Army soldiers who have returned from Korea. The diseases which may be expected to be encountered here, or which are of more importance, will be briefly considered.

DISEASES EXPECTED BUT NOT ENCOUNTERED

Several diseases have been reported in various source books [2, 3] as being present in Korea. However, the follow-

ing have not been encountered in either the South Korean population or in the UN Forces:

1. Tick-borne relapsing fever (louse-borne present)
2. Cholera
3. Malaria caused by *Plasmodium falciparum*
4. Malaria caused by *P. malariae*
5. Schistosomiasis

Scrub typhus (tsutsugamushi disease) was reported as being present in such authorities as the *TB Med 208* on Korea [2] and *Global Epidemiology*.[3] Apparently this was based upon a report of a fever of unknown etiology which was made by Weir in 1915 [4] and subsequently interpreted by the League of Nations in 1936 [5] as having been scrub typhus. In any event, this disease was not encountered until 1951 when a few cases were found.

To date, only louse-borne relapsing fever has been encountered in Korea; the tick-borne variety has not been met with as yet.

Fortunately, cholera has not been encountered due, in part, to the vigorous preventive measures taken by Public Health and Welfare, Supreme Commander, Allied Powers, in working among the indigenous population. This is in spite of previous well defined outbreaks which have been reported in the past. However, it must be considered as an ever-present threat.

Neither malaria caused by *Plasmodium falciparum* nor *P. malariae* have been found today in Korea.

The question of schistosomiasis will be mentioned, since the *TB Med 208* [2] and *Global Epidemiology* [3] on Korea suggest the presence of schistosomiasis caused by *Schistosoma japonicum*. However, no evidence of the disease was found in a survey made in South Korea in 1948.[6] No snail hosts were encountered, no records of autochthonous infections were found, and no information was available on the presence of cases from Japanese parasitologists who lived in Korea for many years.[6] Two cases of schistosomiasis, found at autopsy, were reported in the literature in 1926, but subsequent evidence points to a probable error in the identification of the eggs, and it is believed now that these were the eggs of *Paragonimus*.[6] These cases had not passed *S. japonicum* eggs in the stool.

Ever since the Korean action began in 1950, additional studies were made in the field in both South and North Korea in an attempt to locate evidence of schistosomiasis. In addition, nearly 150 PW's from scattered areas in Korea were skin tested. This antigen, used in dilutions of 1:10,000, had given excellent results in Japan (over 92 per cent correlation with known positives). However, in Koreans only negative results were secured. The stools of these and other PW's were examined (nearly 600 more) and no evidence of *S. japonicum* was found. Examinations of UN soldiers revealed an occasional infection of *S. mansoni* and even one *S. hamatobium*. However, since these were not autochthonous infections and the proper snail host for these species is not known to occur in Korea, it must be concluded that schistosomiasis is not indigenous to Korea.

DISEASES ENCOUNTERED AMONG AMERICANS IN KOREA

Having mentioned briefly some of the diseases which were expected, but which were not encountered in the UN Command, it remains to glance briefly at some of those which do occur.

1. *Respiratory Infections*

It should be pointed out that the Far East Command had lower incidence rates of respiratory tract infections in Japan and Korea than in either the United States or the European Command. In 1945, after the occupation of Korea and Japan began, the cases of

streptococcal respiratory tract infections, followed by rheumatic fever, presented a real problem—fortunately relatively few such cases are encountered today.[1] Influenza A, A prime, and B occurred in Japan, and isolated cases of A prime were found in the winter of 1950–1951 in Korea. The virus and bacterial pneumonias were of essentially equal frequency during 1950–1951.

2. *Diseases Usually Spread by Contact*

It is only fair to admit that there is more venereal disease among our troops in the Far East than in the United States. These diseases differ from those seen here chiefly in a quantitative rather than a qualitative way. Gonorrhea occurs most commonly, then chancroid, while syphilis is much less frequently encountered. It is believed that the high incidence of venereal disease among the troops in Korea, Japan, and Okinawa may be largely attributed to some of the following factors, which have been pointed out by Long [1]:

a. High proportion of very young men in new and unusual environments.

b. Relatively high degree of reporting as compared to areas where civil medical attention is more readily obtainable.

c. Complete faith on the part of troops in modern therapy.

d. The extreme difficulty in identification of contacts.

e. The extremely high infectious rates among available consorts with whom troops can easily establish contact.

f. Legality of prostitution in these areas.

g. Little effective reduction of the civilian infectious reservoir.

It should be borne in mind that with the cessation of hostilities in Korea, the incidence of venereal disease will increase markedly among the troops which may of necessity have to remain.

3. *Intestinal Tract Diseases*

a. *Diarrhea and Dysentery* — Once persons from temperate climates are

TABLE 1

Amebic, Bacillary and Unclassified Dysentery Rates in the U. S. Army† by Quarters‡ 1948–1951*

Amebic Dysentery

Year	*1st Qtr.*	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*	*Annual Rate*
1948	1.87	2.75	2.20	1.39	2.06
1949	0.92	0.51	0.27	0.13	0.50
1950	0.28	0.22	0.43	0.56	0.41
1951	0.47	0.92	0.63	0.83	0.73

Bacillary Dysentery

Year	*1st Qtr.*	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*	*Annual Rate*
1948	0.75	0.96	1.67	1.06	1.12
1949	0.78	0.51	0.30	0.20	0.48
1950	0.07	0.19	1.41	0.68	0.63
1951	0.55	1.01	1.61	0.64	0.98

Dysentery N. E. C. (Unclassified)

Year	*1st Qtr.*	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*	*Annual Rate*
1948	0.65	1.16	1.08	0.54	0.85
1949	0.31	0.09	0.15	0.13	0.18
1950	0.04	**	13.14	3.72	4.47
1951	2.01	2.40	5.02	0.74	2.56

* Rates expressed as number of cases per 1,000 strength per year
† Includes Air Force prior to July, 1949
‡ Report periods by quarters, not calendar quarters
** No cases (0) reported
Source: Statistical Health Report WD AGO 8-122 through May, 1951
Morbidity Report DD-442 June–December, 1951

TABLE 2

*Diarrhea and Dysentery Rates * U. S. Army †*

By Quarters ‡—1948–1951

Year	*Units*	*1st Qtr.*	*2nd Qtr.*	*3rd Qtr.*	*4th Qtr.*	*Annual Rate*
1948	Total—Army	5.27	4.94	6.16	3.35	4.86
	Overseas	8.34	9.17	12.06	5.70	8.75
	Far East	10.34	12.63	18.76	6.73	12.08
1949	Total—Army	2.78	3.08	3.03	2.92	2.95
	Overseas	3.89	4.34	3.45	3.13	3.78
	Far East	4.80	4.79	2.77	2.68	3.92
1950	Total—Army	2.56	3.11	14.04	8.08	7.10
	Overseas	2.34	3.06	28.62	16.45	13.29
	Far East	2.79	3.29	53.89	24.91	23.05
1951	Total—Army	5.98	6.21 **			
	Overseas	11.63	12.91 **			
	Far East	16.80	18.24 **			

* Rates expressed as number of cases per 1,000 strength per year
† Includes Air Force prior to July, 1949
‡ Report period quarters, not calendar quarters
** April–May, 1951, only, as total diarrhea and dysentery are not reported as such thereafter
Source: Statistical Health Report WD AGO 8–122 through May, 1951

transplanted to the tropics, there will be an increase in the diarrheas and dysenteries in the groups concerned (Table 1). No attempt will be made here to explain this on the basis of such recognized factors as dietary changes, greater opportunity for contamination of food and drink, etc. At the moment it is merely desired to present the facts. Reference to Table 1 shows that in 1948–1951 very low rates per 1,000 per annum occurred in the Army as a whole. Table 2 indicates that in all overseas troops the incidence was usually nearly double that for the Army as a whole; the Far East was higher still. The figures on Korea are included in the Far East and so are not available as a separate entity. These data do *not* show the effects of local outbreaks in Korea which were known to have occurred in the Armed Forces. That the rate was not higher is a tribute to those entrusted with the health of the troops.

In contrast to these figures are those secured from PW's or civilians in Korea. As Hardy, Mason, and Martin [7] point out, history abounds with examples of dysentery as a disease of wars. Among the PW's in Pusan and Koje-do, there were outbreaks of "enteric infections with 161 hospitalized cases with a fatality rate of 9 per cent, and some 800 milder, nonhospitalized cases. An average of this number of cases and deaths occurred each day throughout a four-month period. Moreover, the outbreak continued at a lower level for about one year." [7]

Actual official figures of dysenteries among PW's covering July, 1950, through April, 1952 (including hospital and quarters cases), indicate that more than 37,000 cases were reported; this is an admission rate of 165 per 1,000 mean strength per year, with an over-all case fatality rate between 5 and 6 per cent for the period.

This is not surprising as diarrheal disease was present everywhere. The civilian refugees, for whose health and welfare the UN were responsible, lived under very poor sanitary conditions. The PW's had excellent facilities by comparison. It was very difficult to get accurate data; however, it was apparent that if the cases and deaths had been reported accurately, they would

TABLE 3

Types of Bacillary Dysentery Organisms Recovered August, 1951 [8]

Class	*Organism*	*No.*	*Per cent*
Shigella	*S. flexneri* I	5	3.3
	S. flexneri II	34	22.3
	S. flexneri III	23	15.1
	S. flexneri IV	36	23.7
	S. flexneri V	26	17.1
	S. ambigua	3	1.9
	S. boyd—170	1	0.7
	S. boyd—143	1	0.7
	S. sonnei	1	0.7
	S. flexneri (unidentified)	8	5.3
	Total Shigella	138	90.8
Salmonella	*S. paratyphi A*	5	3.3
	S. (other than *paratyphi A*)	9	5.9
	Total Salmonella	14	9.2
	Totals	152	100.0

undoubtedly have exceeded that reported among the PW's.

During August, 1951, there were 689 new admissions and from these, 152 were positive for bacillary dysentery, with a recovery rate of 21.8 per cent. Six of those had double infections. Of the 152 confirmed bacillary cases, the following types of organisms were identified (Tables 3 and 4).

Contrary to results of the July report,[8] in which only *Shigella flexneri* IV predominated, both *Shigella flexneri* II and IV predominated in August, followed by *Shigella flexneri* V. Final evaluation awaits identification of previous cultures (sent to other laboratories) and compilation of total data accumulated.

b. *Intestinal Parasites Among Korean Combat Troops*—During the occupation of Japan and adjacent areas, epidemiologic studies were made on over 30,000 of the indigenous population. These were observed by the same physicians and the stools and blood smears were examined by the same technics and technicians. This yielded a base line of infection with which the Americans could be compared. Occupation personnel were divided into two groups: those who had been in the Far East three months or less, and those who had been there longer. Table 5 summarizes the findings.[9, 10]

In addition to the 985 controls, i.e., those overseas less than three months, one can add the data from over 10,000

TABLE 4

Cases of Double Infections of Bacillary Dysentery Organisms Recovered August, 1951 [8]

Organisms	*No.*	*Per cent of Total Cases*
S. flexneri III and V	1	0.67
S. flexneri III and IV	2	1.32
S. flexneri IV and V	1	0.67
S. flexneri IV and *S. sonnei*	1	0.67
S. flexneri and *Salmonella S. paratyphi A*	1	0.67
Total double infections	6	4.0

TABLE 5

Parasitic Infections Among Americans in the Far East [9, 10]

	Controls		Americans in Far East Over Three Months			
			Korea (1948)		Japan (1946–1951)	
	No.	Per cent	No.	Per cent	No.	Per cent
No. examined	985		241		2,067	
No. parasitized	258	26.2	73	30.3	708	34.3
No. with helminths	36	3.7	20	8.3	110	5.3
No. with protozoa	238	24.2	62	25.7	647	31.3
Ascaris lumbricoides	4	0.4	5	2.1	27	1.3
Trichuris trichiura	13	1.3	3	1.2	34	1.6
Hookworm	16	1.6	11	4.6	51	2.5
Strongyloides stercoralis	5	0.5	1	0.4	2	0.1
Endamoeba histolytica	42	4.3	12	5.0	96	4.6
Endamoeba coli	133	13.5	34	14.1	312	15.1
Giardia lamblia	33	3.4	9	3.7	107	5.2

	Controls		Combat Troops in Korea			
			Less Than Three Months		Over Three Months	
	No.	Per cent	No.	Per cent	No.	Per cent
No. Examined	985		662		127	
No. Parasitized	258	26.2	181	27.3	42	33.1
No. with helminths	36	3.7	71	10.7	29	22.8
No. with protozoa	238	24.2	129	19.4	20	15.7
Ascaris lumbricoides	4	0.4	37	5.6	14	11.0
Trichuris trichiura	13	1.3	23	3.5	13	10.2
Hookworm	16	1.6	23	3.5	9	7.1
Strongyloides stercoralis	5	0.5	1	0.1	0	0.0
Endamoeba histolytica	42	4.3	31	4.7	9	7.1
Endamoeba coli	133	13.5	66	9.9	8	6.3
Giardia lamblia	33	3.4	22	3.3	4	3.1

dispensary patients and 426 WACS. The 985 were 26.2 per cent infected, but the worms were negligible and the pathogenic protozoa (*Endamoeba histolytica* and *Giardia lamblia*) were well within the so-called "normal limits." Over 31 per cent of the dispensary patients were parasitized, the principal difference again being in the worms (ascaris, whipworm, and hookworm). An analysis of these infections reveals that the majority of positive stools were secured from children, thus accounting for the slightly higher incidence reported. The data on the WACS were similar in pattern to the 985 other controls.

Americans who had been in Korea in 1948 and in Japan over three months showed some slight increase in intestinal parasites, mostly worms (Table 5). All combat troops in Korea revealed little deviation from the controls. However, those who were there longer (i.e., over three months) showed an over-all increase in the incidence of parasitism of 6 per cent, while the incidence of worm infections jumped from 10.7 to 22.8 per cent. The protozoa recorded a slight drop. Even with this increase in intestinal helminths, it is doubted that the *density* of the infections was high. In other words, the presence of these parasites would cause *negligible symptoms* in most instances.

4. *Arthropod-Borne Diseases*

If time permitted, a number of the Arthropod-borne diseases might be discussed. Fortunately, however, there were so few cases of many of these diseases in the American or other UN

troops that they will not be considered further at this point. In fact, only three need be mentioned here: Japanese B encephalitis, epidemic hemorrhagic fever, and malaria.

a. *Japanese B Encephalitis* — Much has been written, and much could be said, about this insect-borne disease which appears to be unique to the Far East. According to the 406th Medical General Laboratory [10] and the Surgeon's Office, FEC,[1] the infection appears to belong to the large group of virus encephalitides and for all practical purposes, it is indistinguishable from the others. It occurs in Korea, Okinawa, and Japan, and during 1950 there were 300, 16, and 30 cases reported respectively, among Americans. In Korea in 1950, the disease began late in August and continued into October. The case fatality rate ran about 10 per cent, and fortunately severe nervous system residuals were uncommon. It has been demonstrated that *Culex tritaeniorhynchus* is a vector.[9, 10] It is believed that the reservoir host is centered in the native population and that the adult members of such communities possess a high degree of immunity. In 1951 there were less than 60 cases of all types of encephalitides with little or no Japanese B encephalitis and no deaths. This appeared to be correlated with a reduced mosquito population (in Japan at least).

It is obvious that mosquito control offers the best means of prevention, but the conditions under which they exist in such areas as Korea or Okinawa make it difficult to attain. Consequently, all United States troops in Korea, Okinawa, and Japan were given Japanese B encephalitis vaccine, even though it is admitted that its usefulness must be regarded as not proved. However, it appears likely that some degree of protection is afforded. It appears unlikely that there will be any public health problems arising in the United States as a result of these infections.

b. *Epidemic Hemorrhagic Fever* — Diseases identical with or related to epidemic hemorrhagic fever have been studied by Russians. The Japanese reported cases of epidemic hemorrhagic fever among troops in Manchuria between 1936–1942 and claim to have isolated a filterable virus. Cases in Manchuria were encountered most frequently among soldiers, immigrant agricultural workers, and others who handle hay for fodder or bedding.[11] This disease was encountered in UN troops in Korea during 1950 and 1951. Serologic studies with paired sera did not give evidence of leptospirosis.[12] On the basis of the clinical picture, a tentative diagnosis of epidemic hemorrhagic fever was reached in 1951. However, to date American workers have not succeeded in isolating the etiologic agent.

The disease appears to be seasonal, showing two peaks a year. The first peak fell between June and August in 1951 and the second extended from October to January, 1952. The following year the first peak was reached between May and August, 1952, while the second ranged between October and December.

The distribution of clinical cases parallels rather closely the population curves of certain Trombiculid mites. These and other possible vectors are being studied by members of special research teams now in the Far East.

c. *Malaria* — Malaria was known to exist in Korea prior to the beginning of hostilities. The Japanese knew that it was there,[2] and the Surgeon's Office of the Far East Command was aware of its existence. Its presence was substantiated by the report of the survey made in 1948.[6, 13] At that time it was emphasized that: (1) *Plasmodium vivax* was the dominant species; (2) *P.*

TABLE 6

*Malaria Rates * in the U. S. Army † By Quarters ‡—1948–1951*

Year	Units	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Annual Rate
1948	Far East	6.53	10.83	16.24	5.22	9.69
	Korea	1.84	13.76	48.36	6.69	19.16
	United States	1.03	0.94	1.00	0.51	0.84
1949	Far East	2.41	8.47	11.63	2.01	6.14
	Korea	0.95	53.63	19.86	**	23.88
	United States	0.41	0.64	0.97	0.47	0.60
1950	Far East	0.57	0.37	15.44	2.42	4.70
	Korea	**	**	28.82	3.18	11.04
	United States	0.42	0.42	0.17	0.12	0.26
1951	Far East	2.32	18.20	19.17	4.97	11.54
	Korea	2.76	15.42	15.86	4.98	9.96
	United States	0.18	6.16	34.43	13.72	13.93

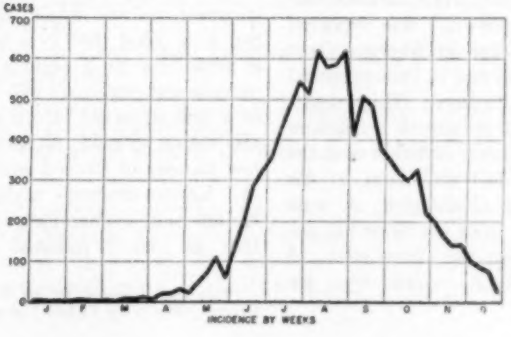
* Rates expressed as number of cases per 1,000 strength per year
† Includes Air Force prior to July, 1949
‡ Report quarters, not calendar quarters
** No cases (0) reported
Source: Statistical Health Report WDAGO Form 8-122 through May, 1951
Morbidity Report DD-442 June-December, 1951

malariae was virtually nonexistent; and (3) *P. falciparum* had apparently been encountered only in drug addicts.[2, 4] This was based upon detailed studies made by Japanese workers during their occupation of Korea.[6, 13]

It was recognized early in the Korean action that malaria would be a problem. The suppressive drug, chloroquine diphosphate, was supposed to be available to the various Air Force and Army personnel by the middle of August in 1950. Actually, many units never received it. Malaria discipline was poor. The preventive medicine companies were scarce and the front was so fluid in 1950 that effective control measures were well nigh impossible. The principal mosquito vector, *Anopheles hyrcanus* var. *sinensis*, breeds readily in paddies, stagnant pools, swamps, and ditches and thus was widespread throughout the area. The stage was set; we had malaria. Table 6 shows

FIGURE 1

MALARIA—U. S. Army in the United States, 1951.



clearly that considerable malaria was found among Americans in Korea prior to 1950. The high rates can mean but one thing — *poor malaria discipline.* This was even truer, apparently, after the troops left and only members of the Korean Military Advisory Group remained.

During 1950 when things looked so black in Korea, there was little opportunity to maintain the troops on adequate suppressive doses of chloroquine diphosphate. Many of the personnel having a fever of undetermined origin were treated empirically for malaria a short distance from the front and returned to their units.

During the 1951 malaria season, attempts were made by means of questionnaires to determine whether chloroquine was being administered. Personal interviews were made, but even so the data are probably not very reliable. Instances were encountered where small units became "forgotten men" as far as chloroquine was concerned. Even in hospitals it was not always given or properly checked.

The lack of laboratory technicians adequately trained in malariology in the various hospital units in Korea undoubtedly led to some confusion in the diagnosis of malaria. Sometimes under such circumstances the issue was also further clouded by the enthusiasm and lack of experience of the physician which led to false reports. For example, in December, 1950, an outbreak of "*falciparum malaria*" was reported by a single hospital in Korea. Over 30 cases were supposed to have occurred in slightly over 30 days. This report, because of its unusual nature, created an uproar. Investigation revealed that the slides had been lost and most of the patients had been discharged. A team examined smears from the next 300 patients coming from the same units. A single smear of *P. vivax* was encountered!

Since then one real case of *falciparum* malaria turned up—in a South American UN soldier who came down almost as soon as he placed his foot on Korean soil. Obviously, he had not acquired this infection in Korea.

Turning to the United States, we find that there were approximately 216,000 personnel returned to the Zone of the Interior, between July 1, 1950, and December 31, 1951.* In this group, 12,592 cases of malaria were found. They may be broken down as follows:

10,305 new cases
2,287 relapses

12,592—or about 5.8 per cent

If a graph is made, it will be noted that the peak was reached in August, with a total of about 2,900 cases. Twice during this month approximately 600 cases were reported in a single week (Figure 1). A similar curve was found in 1952. However, only 10,662 cases were reported in 318,000 returnees, or about 3.4 per cent. Current incidence is even less.

One naturally raises the question of the possible transmission of malaria to indigenous population groups in this country. A good vector, *Anopheles quadrimaculatus,* exists and has been shown to carry the Korean strain of *P. vivax* readily. Furthermore, the mosquito vectors may still be found around such posts as Fort Knox and Fort Benning, or in more isolated areas. However, on the whole, mosquito control is so good that it is believed there is little risk of a serious outbreak of malaria and that cases will be kept down to a few scattered infections. To date this seems to hold, as there are only a few records of proved indigenous cases of Korean-derived malaria in the United States. Therefore, it is concluded that the risk is minimal *provided* our

* From data furnished by the Preventive Medicine Division, Office of the Surgeon General, U. S. Army.

efforts at mosquito control are not relaxed.

SUMMARY AND CONCLUSIONS

Only the more important diseases occurring among Americans were considered. From the standpoint of public health there seems to be little danger of the introduction of transmissible diseases from Korea to the United States. The incidence of intestinal worms in U. S. Army veterans of the Korean campaign appears to be somewhat higher than elsewhere in the Far East. However, the density of the infection in the individual is low, and so should not constitute a public health problem. Malaria constitutes the greatest risk, but in view of the record it is believed that the calculated risk is minimal, provided adequate mosquito control is maintained.

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Philosophy of Experimentation Reprints Available

The three papers on the "Philosophy of Experimentation" published in this *Journal* in June, 1953, are now available in reprints. These papers are the second in a continuing series planned by the Committee on Sampling Techniques in Public Health Statistics of the Association's Statistics Section. According to this plan a program of papers dealing with statistical methods in the design of public health experiments and studies will be presented at annual meetings of the Association at two-year intervals.

The titles of the three papers presented at the 1952 annual meeting and now available in reprints are:

Philosophy of Inferences from Retrospective Studies—Harold F. Dorn, Ph.D.
Matching in Analytical Studies—William G. Cochran
The Use of Analysis of Covariance and Balancing in Analytical Surveys
—Bernard G. Greenberg, Ph.D.

They are available from the chairman of the committee, T. D. Woolsey, Division of Public Health Methods, Public Health Service, Washington 25, D. C. Also still available are a few copies of the first series on "Modern Methods in the Sampling of Human Populations" given at the 1950 annual meeting and published in the *Journal* of June, 1951.

Presented here is further evidence that relaxing controls on the sale of psittacine birds may have been unwise. It is suggested that some of the protective steps might well be retraced.

Mounting Incidence of Psittacosis

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IN the last few months of 1952, the Virus Diagnostic Laboratory of the University of Pennsylvania, located at the Children's Hospital of Philadelphia, received an unusually large number of requests for tests for psittacosis. The number of positive findings exceeded the total for the preceding three years. While there were only three positive or suggestive laboratory findings in 1951, seven in 1950, and three or four in 1949, there were more than 25 such findings in 1952 on patients whose illness was clinically or epidemiologically consistent with psittacosis. The remarkable increase in clinically diagnosed or laboratory-confirmed psittacosis appeared to be related to the great increase in traffic, advertising, and sales of parakeets, in Pennsylvania, at least. We believe that more birds were sold in 1952 than during any other year since 1930. We have learned that variety and department stores, which were not selling parakeets before, began selling these birds in 1952 after the ban against psittacine birds was lifted. The relaxation of controls was regarded as a clean bill of health for the parakeet by dealers and purchasers. It led to a rapid creation of new sources of parakeets, often derived from unknown stocks. A number of peddlers entered the field offering for quick sale, birds, many of which were infected.

While it is realized that birds other than parakeets may be infected with the virus of psittacosis, there are at least four reasons for considering parakeets as the cause of the rise in the incidence of the disease:

1. The great majority of the patients in our series owned, raised, or sold parakeets.
2. Psittacosis virus was isolated from several parakeets owned or sold by some of the patients in this report.
3. The contact with parakeets is likely to be more intimate than with other birds, such as chickens, turkeys, or pigeons, except in certain occupational groups. One of our patients volunteered the information that she allowed the parakeet to remove food from her mouth.
4. There has been no comparable increase associated with birds other than household pets.

In addition to the number of patients for whom definite or suggestive laboratory evidence for psittacosis was obtained, there was a group of patients, almost as large, in whom psittacosis was suspected but could not be definitely confirmed for a number of different reasons. Some of these patients showed incomplete development of antibodies or

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NOTE: The laboratory diagnostic studies were supported by the Department of Health, Commonwealth of Pennsylvania. Certain phases of this work were supported by a contract between the Office of Naval Research, Department of the Navy, and the Children's Hospital of Philadelphia, Pa.

TABLE 1

Laboratory Number	Age	Sex	Race	City	Occupation	Exposure to Birds	Date of Onset 1952	Physical Findings	Chief Complaint	X-ray	Duration	Treatment and Response	Complement Fixation with Psittacosis Virus		
6427	35	M	W	Wilmington, Del.	Professional	Parakeets	2/5	Pneumonitis	General malaise and fever	Week after Rx neg.	2 weeks	Aureomycin good response	3/26 10	4/15 10	5/20 <10
8029	11	F	W	Media, Pa.		Parakeet	8/25	"	Dry cough, chest pain, fever (102°–103°)	P.A.P.	2 weeks	Aureomycin good response	9/8 40	9/20 5	
7347	46	F	W	Wilmington, Del.	Housewife	Parakeets	9/1	Fever, chills, nonproductive, cough, rales over left chest	Low back pain, chest pain, fever	Haziness over left chest (base)	6 days	Aureomycin good response	9/26 4	10/22 16	
7336	45	F	W	Drexel Hill, Pa.	"	Parakeet	8/15	Fever	Fever, perspiration, rigor	9/16 Bilateral patchy, pneumonitis 9/23 neg.	5 weeks	Penicillin no improvement Aureomycin started 9/17 good response	9/18 160	9/30 320	12/4 160
7456	40	M		Lancaster, Pa.	Laborer	Chicks, chickens	9/1	Fever, productive cough	Fever, cough	Pneumonia	6 weeks	Terramycin good response	80–160		
7465	33	M	W	North Wales, Pa.	Utility Company employee	Canary	8/19	Fever					10/3 80		
7729	17	F	W	Pittsburgh, Pa.		Parakeet	11/13						11/19 <2	12/30 32	
7746	38	M	W	Johnstown, Pa.	Greenhouse man	Parakeets	11/15	Pneumonitis	Chills, fever, aches	P.A.P.	3 weeks	Aureomycin good response	11/21 <8	12/9 20	
7770	60	F	W	McKees Rock, Pa.		Parakeet	11/23						12/4 4	12/12 32	1/12 16
7786	42	F		Johnstown, Pa.	Housewife	Parakeet		Slight fever, photophobia	Nervousness, headache		1 week	Penicillin good response	12/18 4	12/19 8	1/20 16

Note: P.A.P.—Primary Atypical Pneumonia.

TABLE 1 (Cont.)

Laboratory Number	Age	Sex	Race	City	Occupation	Exposure to Birds	Date of Onset 1952	Physical Findings	Chief Complaint	X-ray	Duration	Treatment and Response	Complement Fixation with Psittacosis Virus		
7855		F	W	Beaver Falls, Pa.	Housewife	Parakeets	12/3						12/13 10	1/14 80	
7857	42	F	W	Newport, Pa.	Store manager	Parakeets	12/16	Fever	Dull headache		4 weeks	Terramycin good response	12/24 2	1/9 * p4	1/29 32
7875		F	W	Newport, Pa.	Store clerk	Parakeets							12/29 2	2	1/29 8
7876	47	F	W	Middletown, Pa.	Housewife	Parakeets 1 died, canaries	12/11	Dyspnea, conjunctivitis, rales	Chills, fever, perspiration, weakness	Bilateral pneumonitis	4 weeks	Aureomycin started 12/25 good response	12/30 80	1/9 160	
7883	41	F	W	Newport, Pa.	Housewife	Parakeet	12/9	Fever	Aching, especially lower back; perspiration		2 weeks relapsed 1/12	Sulfa 12/26 to 12/30 Aureomycin 1/15/53	12/27 80	1/15 40	
7954	14	M	W	Pittsburgh, Pa.		Parakeet (bird not sick but virus isolated)	11/11	Fever, palpable spleen	Fever, chills		7 days	Penicillin good response	Nov. neg.	12/30 32	
7957	58	M	W	Tarentum, Pa.	Fruit station attendant	Psittacine birds	12/1	Fever, sweating	Weakness, sweating	Infiltration right hilar area	2 months	Penicillin and Aureomycin Temperature returned to normal after aureomycihn	12/28 2	1/8 32	

* Refers to partial fixation of complement (1 or 2+)

had no antibodies for the psittacosis group of viruses. This may have reflected antibody suppression by broad-spectrum antibiotics. In other patients it was difficult to rule out previous infection with other members of the psittacosis LGV group of viruses. Furthermore, in many instances it was impossible to get convalescent or post-convalescent serum specimens for completion of the study.

Seventeen of the patients for whom fairly complete information of clinical and laboratory nature was available are shown in Table 1.

It will be seen from this table that some of the patients developed only low-antibody levels, and some showed actual decreases in antibodies. It is entirely possible that both situations were caused by treatment with antibiotics. It is of interest that patients for whom therapy was delayed, such as patient 7336 and patient 7876, had relatively high titers.

Several of the patients presented rather interesting epidemiological stories. Patients 7857 and 7875 were employees of a 5 & 10 cent store which had begun to sell parakeets for the first time. A visit to the store by Dr. E. J. Witte of the Pennsylvania State Department of Health, revealed many cages of parakeets hanging over the candy counter. One of the customers who bought a parakeet at the store, as well as the two employees, became ill with a respiratory infection and a diagnosis of psittacosis was made.

Patients 7729 and 7954 are members of the same household. This family experienced a most unusual outbreak of psittacosis.[1] The parakeet in question *did not show signs of illness;* nevertheless, *it yielded psittacosis virus on examination.** One member of the family became ill and died. His lungs yielded the virus of psittacosis.* In addition to the two clinical cases which are shown in Table 1, two other household members showed antibodies to psittacosis without actually having shown signs of illness. Thus, in this family the disease ran a course from inapparent infection to fulminating fatal disease all due, apparently, to the same strain of virus acquired from the household pet.

Patient 7336 is the mother of a child whose serum showed varying titers to the psittacosis virus. The child did experience a respiratory illness but definite diagnosis of psittacosis could not be made and the child is not listed in the table.

The daughter of patient 6427 died suddenly. Diffuse pneumonitis was found. No cultures for psittacosis virus were made, however, and it is therefore impossible to state that psittacosis was the cause of the death. Nevertheless, it should be mentioned that a number of parakeets were kept in the child's room and that the father experienced an illness clinically and serologically compatible with psittacosis.

Early signs point to a continuation of the high incidence of psittacosis in 1953. During the first three months of this year the Virus Diagnostic Laboratory has encountered positive serologic results in seven patients. It is not known at the present time how many of these actually represent psittacosis. It should be mentioned, however, that one of these patients was associated with parakeets which were subsequently shown to contain psittacosis virus.

The experiences in Pennsylvania are by no means unique. Small outbreaks of psittacosis have been reported in New York State.[2] In addition, unpublished information which has become available to us recently indicates that there has been an increase in human psittacosis in Illinois, Minnesota, Ohio, Missouri, Iowa, and in Europe.

* Studies performed at the Virus and Rickettsia Section, Communicable Disease Center, Public Health Service, Montgomery, Ala.

This brief report has been prepared in order to call the attention of physicians and public health workers to the possibility of psittacosis occurring in their communities; to urge vigilance; and to stress the necessity of submitting serum of patients with primary atypical pneumonia or other respiratory infections, who have had contact with birds, to virus diagnostic laboratories.

While it is not within the province of this paper to suggest methods or approaches for the prevention of future outbreaks of psittacosis, it is felt, nevertheless, that a few comments in this connection may be justified. In the light of the above experiences, we believe that public health authorities should reconsider the decisions made regarding the relaxation of regulations of traffic in psittacine birds. Some action should be taken regarding the establishment and enforcement of regulations pertaining to the acquisition and sales of such birds. The greatest offenders appear to be the unscrupulous dealers who distribute illegally acquired birds, many of which are infected. Above all, we believe that the best means of preventing human infection with psittacosis is an educated public. Education which would impart information about the hazard associated with the raising and handling of parakeets may accomplish real results. Furthermore, education would help to stimulate recognition of the need for an intensive and permanent program of eliminating infected stock, of keeping psittacosis out of domestic aviaries and of the importance of providing funds for such a program. This program should include periodic testing of "normal" birds because of the possible occurrence of infection in birds which show no signs of illness.

The advent of broad-spectrum antibiotics has removed some of the fear associated with psittacosis. The disease responds very well to these drugs and the mortality rate has definitely decreased. The practice of antibiotic therapy has one disadvantage as far as virologists are concerned, and that is that intensive and prolonged therapy often suppresses or delays antibody formation, thus, making a diagnosis difficult if not impossible. Actually, more work is necessary on the problem of appropriate antibiotic therapy in psittacosis. Such work may yield information as to the dosages and schedules which would insure clinical response and at the same time allow for the development of antibodies which are not only important in the diagnosis of the disease, but which may also be important in the establishment of permanent immunity.

ACKNOWLEDGMENT—We wish to thank all the physicians who gave us their generous cooperation and to Dr. William D. Schrack, Jr., epidemiologist, Department of Health, Commonwealth of Pennsylvania, and Dr. Ernest J. Witte, acting chief, Division of Veterinary Public Health, Department of Health, Commonwealth of Pennsylvania, for their help and contributions in the epidemiological investigations connected with this study.

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Some of the great contributions to communicable disease control a veterinarian on a health department staff can make are convincingly set forth.

Animal Diseases Transmissible to Man*

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FOR many years, during the synthesis of organized public health, the veterinarian was on the outside looking in, helping when asked, but in most cases simply riding a parallel path of public service. In the last decade, however, there has been a gradual re-evaluation of veterinary skills by public health administrators. The result has been the integration of veterinarians into general health programs. More than 25 per cent of our states now have full-time public health veterinarians functioning at the state level.

An editorial entitled, "The Zoonoses" (diseases which are naturally transmitted between animals and man), appearing in the April, 1953, issue of the *American Journal of Public Health*, states: "With the notable reductions which have taken place in many diseases spread from man to man, the relative importance of certain infections which may be spread from animals to man becomes greater." The editorial also refers to a list of 86 different diseases transmissible between animals and man. This list consists of 20 viral, 20 bacterial, 10 nematode, 10 trematode, 9 cestode, 8 protozoal, 7 rickettsial, and 2 fungus diseases. The logic of having a veterinarian on a team that must deal with this variety of animal-borne diseases cannot be disputed.

Zoonoses are spread in a variety of ways. Urban dwellers as well as farm populations are exposed to contact with the causative agents. They may be spread by direct contact with an infected animal, by contamination of human food through infective animal discharges, by transmission from the infected animal via an insect or rodent host vector, by contamination of air and water, and by consumption of infected animal products in the form of milk, meat and eggs. Since so many of these disease organisms may be transmitted to human beings by means of the environment, one of the best ways in which to eliminate the greatest source of contamination is by eliminating the disease in the host animal populations. Reference will now be made to some of the most important of the zoonoses with some mention of the mode of spread to man.

VIRAL DISEASES

Encephalitides—The arthropod-borne virus encephalitides form a group of viral diseases spread to man by mosquitoes and in some cases by ticks from birds, horses, wild mammals, sheep, and even monkeys. It is not actually known in the case of these encephalitic diseases whether the animal or man is the carrier or the normal host. In the case of the eastern equine encephalomyelitis it is suspected that birds are the normal host of this virus and that horses and man are merely the dead-end stops in

* Address presented at the Nineteenth New England Health Institute at the University of Rhode Island, Kingston, R. I., June 12, 1953.

which the disease actually makes a visible appearance. Pheasants, incidentally, are among the few birds which show symptoms of the disease. Most other bird species carry the virus but do not show symptoms. This is one of the groups of infections of animals which are normally spread to man by means of an insect vector. Studies are under way to control effectively the spread through the use of vaccines and greater knowledge of the ecological factors concerned.

Cowpox—The history of smallpox and the production of vaccinia virus as a protective agent is a familiar story, including the term "milk maid's hands." Persons who have milked infected cattle contracted cowpox which fortunately protected them from developing the more serious disease of human beings, smallpox. This is a well proved case of animal-to-man disease transmission.

Lymphocytic Choriomeningitis—This influenza-like disease in man normally is contracted by man through contaminated food or dust and occasionally by an insect bite. The disease is not known to be communicable from man to man and its normal host is the common house mouse. The virus escapes from the infected animals in oral and nasal secretions, urine, and feces which by contaminating contacts affect man. Dogs, monkeys, and other animals are equally susceptible to the disease and continue to transmit the virus to man, once having obtained it from mice.

Psittacosis — The term "psittacosis" or "ornithosis," applies to certain viral diseases which affect birds and man and is in the lymphogranuloma venereum group. This disease occurs in parrots, parakeets, love birds, pigeons, canaries, turkeys, and chickens. The normal method by which man gets this disease is by contact with an infected bird or the environment in which an infected bird has recently been located. Occasionally man-to-man occurrence may obtain.

Rabies—Rabies is a virus disease which affects all warm-blooded animals, including dogs, cats, wolves, foxes, jackals, and vampire bats. It is usually transmitted to man by means of the bite of an infected animal. It may also occur when infected animal discharges, such as saliva, come in contact with the broken skin of a human being. This disease is considered fatal, although there is presently some question as to whether recovered cases do occur. The only treatment that is now available is preventive vaccination prior to symptom occurrence. A serum for human use is being experimented with but it is not in general use. Preventive measures currently employed by public health authorities include: stray animal pickup; preventive vaccination; lowering of population of possible wild-life vectors; and education of general public, including dog bite treatment.

Vesicular Diseases—Vesicular exanthema, vesicular stomatitis, and foot-and-mouth disease represent a group of vesiculating diseases which affect mucosal and integumentary areas of domestic animals, and which to a very minor degree may be transmitted to man. Their importance, however, with respect to the availability of milk and meat for our human population warrants attention at this time. Should foot-and-mouth disease occur in the United States, it has been conservatively estimated that the production of milk and meat for the decade following such occurrence would be decreased by 50 per cent, or more. One can readily see that from a nutritional standpoint the increased cost of animal protein foods due to such occurrence is important to health authorities in view of the grave concern that would arise as to the nutritional adequacy of the national diet.

RICKETTSIAL DISEASES

Among the rickettsial diseases are endemic typhus, Rocky Mountain

spotted fever, scrub typhus, rickettsial pox and Q fever. Q fever, a relatively new disease in the United States, has been intensively studied in the Los Angeles area. The findings were that cattle in some areas were infected in excess of 15 per cent of the total population and that human beings could get the disease by the consumption of raw milk. It was also found that in some instances normal pasteurization of the vat type failed to kill the organism. This organism, *Coxiella burnetii*, affects cattle, sheep, goats, bandicoots, and dogs. The disease may be spread by direct consumption of the organism and by the bite of a tick, such as the brown dog tick. It is thought, however, that the most probable avenue is by airborne contamination.

BACTERIAL DISEASES

Bacterial diseases that affect man and animals are probably more familiar than some of the others that have been mentioned. This group includes anthrax, which affects most animals; brucellosis, present in cattle, swine, goats and sheep; and glanders, a disease of horses. Among others are rat bite fever, relapsing fever, staphylococcal and streptococcal infections, and tuberculosis.

Leptospirosis, a bacterial disease of rodents, swine, dogs, and cattle, produces in human beings Weil's disease and other types of jaundice. *Leptospira pomona*, normally found in cattle, is a disease organism which will be of increasing importance in the next few years, for it has been found by sampling procedures to be now affecting 5–6 per cent of cattle in certain areas. Control procedures are not as yet set up for this disease, and there is need to evaluate such procedures with respect to the incidence of the disease in man.

Pasteurella diseases, such as plague, pseudotuberculosis, and tularemia affect cattle, cats, birds, rats, and other rodents. They are normally spread to man by means of the bite of fleas, ticks, and lice, and in some cases by the ingestion of, or contact with, the infected animal, as in the case of tularemia in rabbits.

Salmonellosis is a particularly interesting bacterial disease of animals which affects many animals species and birds. It is normally spread to man by means of the ingestion of the organism. One way in which this spread occurs is by eating eggs or meat from infected animals or poultry which have not been cooked sufficiently to kill the organisms. It should be noted, however, that in many instances epidemiological investigations have revealed that, although the Salmonella organism originated in either a chicken or a piece of meat, the actual human ingestion occurred by way of cooked shrimp or luncheon meat. In most supermarkets cooked shrimp or sliced luncheon meat, which is not treated further at home, is purchased at the same counter where cut-up frying chickens are displayed. The counter man who cleans and serves the chicken is usually the same person who serves the shrimp and luncheon meat. His hands are many times severely contaminated with Salmonella organisms from a bird which he has cleaned, but which has no recognizable symptoms of the disease. The chicken is thoroughly cooked; the shrimp and luncheon meats are not. The disease is thus transmitted by the mishandled shrimp and luncheon meat. It has also been found that the housewife brought home a chicken or some meat, placed it on a drainboard, and then properly cooked the meat or chicken, but then, she proceeded, after a cursory washing of the board, to clean celery, lettuce, and other items which were to be eaten raw. One can readily see that this is an instance in which an animal disease is transmitted to human beings via the contamination of other foods.

FUNGUS DISEASES

Among the fungus diseases that affect man are aspergillosis, a disease of birds and cattle, which human beings get by inhalation, and blastomycosis, a disease of dogs which human beings contract by intimate contact.

Coccidioidomycosis is a disease which affects rodents, cattle, sheep, dogs, and men in the southwestern portion of the United States and which may occur by inhalation, ingestion, and contact. It is not known which of the aforementioned is the actual channel of transmission, but it is known that the entire area is well seeded with a fungus infection which affects both men and animals. Another disease similar in type is histoplasmosis, which in the Kansas area affects dogs, rodents, and cattle and in some instances has simulated tuberculosis, and, fortunately, for the human beings involved, has not proved nearly as deadly.

Other fungus diseases are lymphangitis, ringworm, thrush, favus, and actinomycosis.

WORM DISEASES

Worm diseases which affect man include flukes (trematodes), tapeworms (cestodes), and roundworms (nematodes). Among these diseases are some of which are well known. Numerous worm infestations are spread from animal hosts such as pigs, dogs, cats, cattle, swine, horses, monkeys, rabbits, sheep, birds, bears, wild animals of all types, and rodents. These diseases may be spread to human beings by means of the ingestion of a part of the animal, by a contaminating contact, or by the bite or ingestion of ticks, fleas or mites which were in contact with the animal.

Beef tapeworm in cattle is an interesting type of cestode disease, because the mature tapeworm in human beings liberates segments and eggs which are passed in human feces. When such human feces do not become again available to cattle, the cycle is broken. If, however, human feces are indiscriminately spread on a field where cattle forage, the cattle then are infected with the larval form of this disease and produce in their bodies cysts, which locate in the musculature and are then available for ingestion by human beings when a rare steak is eaten which has been derived from such infected animal. Several years ago in the Southwest it was noted that an increased incidence of these beef tapeworm condemnations occurred at federal meat inspection plants. A study was made by the Public Health Service, Communicable Disease Center, Veterinary Public Health Division, which resulted in a planned procedure to prevent the migratory workers in the truck garden fields from defecating where the cattle were going to eat. The incidence of the disease went down. This was a reverse procedure to that normally attempted in the control of animal and human diseases.

Another of the worm diseases of animal which affects man is trichinosis. This disease affects swine, rats, bears, and other carnivorous animals; and the cyst in the infected pork or bear meat when eaten by man, if improperly cooked, produces trichinosis. The disease would not occur in swine normally, if swine did not have access to raw garbage containing raw pork and if they had no access to infected rodents which they might consume. It is interesting that some studies have pointed up a method of virus disease spread via worm cysts and eggs such as trichinae and roundworm cysts which carry virus. This work was done with lymphocytic choriomeningitis and with swine influenza virus.

TOXIN DISEASES

In this group of diseases are those such as botulism, tetanus, tick paralysis, and staphylococcal toxemias. It, there-

fore, is not necessary for a human being to actually ingest the live organism but merely the poison produced by such organisms. As an illustration, if a cow is infected with staphylococcal mastitis, this milk may be pasteurized but during the interval of time between withdrawal from the animal and pasteurization toxin formation occurs. The toxin is thermostabile and even though the organism is killed, in some cases, the consumption of this milk will produce a serious diarrhea in infants. If sufficient toxin is formed, symptoms may even be noticed in adults. The only practicable means of control, therefore, is to prevent such mastitic infections of cattle.

In conclusion, considering that many of the zoonoses are not properly diagnosed, that many physicians, nurses, and pathologists are unaware of the animal diseases endemic in their area, some attention should be paid to increased liaison between those who know animal diseases and the other professions allied in protecting the public's health. This would best be handled by the affiliation of a veterinarian fully trained in public health technics to the staff of a department of health. In addition, it would undoubtedly be of substantial benefit were hospitals to appoint on their staffs a consulting veterinarian who could and should attend staff meetings. His help in directing attention toward complete history and work-up in the case of undiagnosed human illness would greatly aid the practicing physician in the proper diagnosis and treatment of his patient. Animal diseases are ubiquitous and may cause illness in human beings in the course of their day's work or in the course of the normal activities of eating, drinking, and sleeping.

The Journal 25 Years Ago

"Of What Use Are Our Health Officials?" is the intriguing title of an editorial in the *Journal* of March, 1928 (18, 3:342). "Fear is the genesis of the health officer," introduces a discussion of the growth of health services because of the need to control the great epidemic diseases. Even though the list of the health officer's useful accomplishments is impressive, it hardly encompasses the varied services of today. But the modern day is definitely foreshadowed in these words, "The new health movement of the present century relies largely on education" and as relevant today and tomorrow as yesterday is "The local health executive must be the center of community health work. What is needed is not an increase in his powers, but protection against wicked political interference." (This was written at the time when the public health world was shocked by the dismissal of Herman N. Bundesen, M.D., Chicago health officer, by the newly elected Mayor Thompson, also discussed editorially on page 69 of the same volume.)

We take a well justified pride in our martyrs to public health research—those who have sacrificed their lives to save others from disease—but the time has come for us to take an equal pride in efforts to prevent such martyrdom.

Bacteriological Safety

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SEVERAL publications related to the subject of bacteriological safety have appeared from these laboratories in recent years.[1-5] Following the APHA "Symposium on Laboratory Infections" at the annual meeting in 1950, there have been a number of interesting articles on the protection of the laboratory worker against the hazards of infection.[6-8] It seems appropriate at this time to list further pertinent references not included in the above references.[9-15]

An important part of any safety campaign is the determination of the nature and extent of the hazards. Some of the available information on the potential infection hazards of bacteriological technics has not been published because it has not lent itself to a unified exposition. It seems desirable to summarize this and to include selected previously published tabular data in revised form, together with some items which will appear later in more detail in Table 1, shown at the end of this paper.

In considering the figures presented in Table 1, the laboratory worker should bear in mind that although he most certainly will absorb some microorganisms if he uses ordinary technics—whether or not he will become ill depends on four major interrelated factors: (1) dosage, (2) virulence of the organism, (3) route of infection (e.g., skin, eyes, mouth, lungs), and (4) resistance of the individual (state of health, natural resistance, previous infection, response to vaccines and toxoids).

METHODS

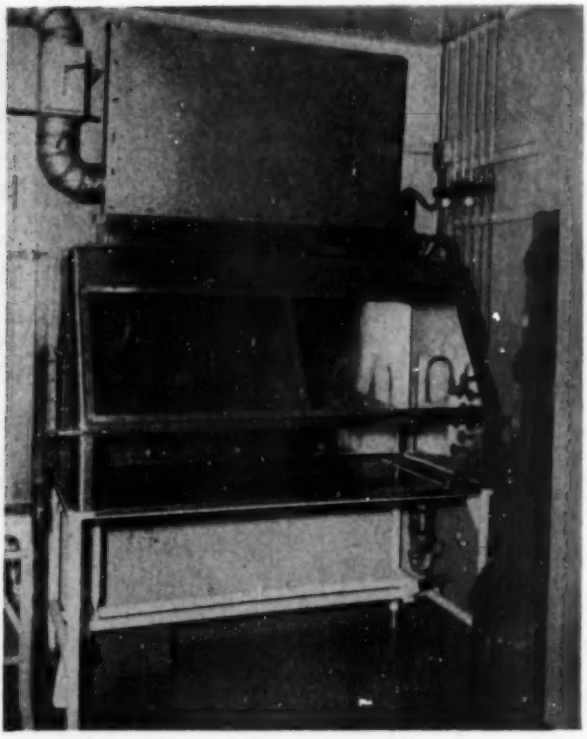
The experimental method has been described previously.[4, 5] Essentially this involves air sampling with the sieve type air sampler during a standard bacteriological operation. The resultant figures given in Table 1 are averages; wide variations are possible. These variations often depend upon what seem to be minor changes in technic peculiar to the individual concerned. A reported count of two, for example, means that two colonies grew out on the agar sampling plate. It is believed that most of the droplets, in aerosols liberated during the operations studied, are rather large and contain five or more bacteria. Therefore, a count of two reported in the table is likely to represent 10 or more organisms to which the operator was exposed. The efficiency of the sieve sampler in recovering aerosolized particles of heterogeneous sizes and composition under varying humidities is not easily nor precisely determinable; efficiencies have varied from 43 to 73 per cent.

The results are presented in Table 1.

SAFETY MEASURES

In chemistry and in radioisotope studies the most useful, versatile, and effective piece of safety equipment is a

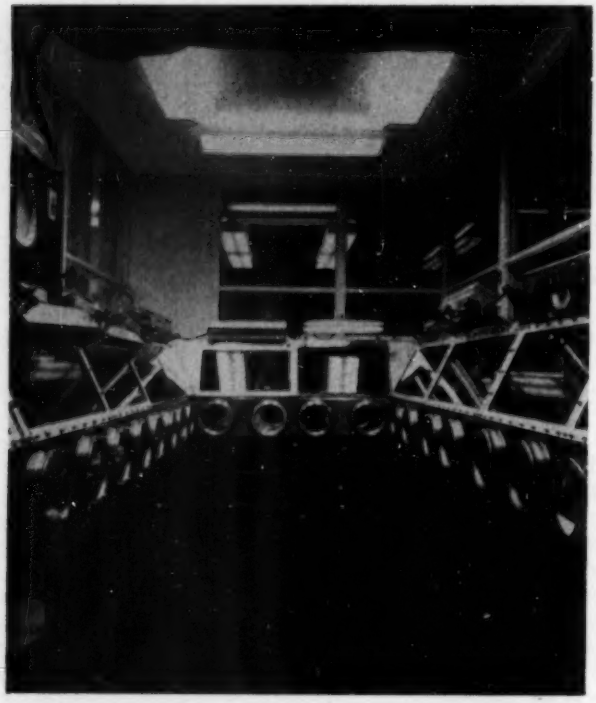
FIGURE 1



hood [16] or dry box.[17, 18] The same applies to bacteriology. The principle is identical, namely, the use of glass shielding and ventilation to sweep noxious air away from the worker. Bacteriologists have been comparatively slow to accept this idea, partly because of absence of proof that conventional technics are hazardous and partly because of a tradition of personal sacrifice. As bacteriology has passed from the phase of the lone investigator to that of team research, and as informal arrangements for hospital care and compensation of the occupationally ill have changed to legally defined and increasingly large compensation benefits, there has developed a realization that it is out of date to expect or permit the principal investigator and his technical and nontechnical assistants to contract the disease under investigation.[7] Federal administrators should bear in mind that under the Federal Employees Compensation Act, occupational death of the head of a family, consisting of a wife age 35 and three children average age four, may result in payments, based on the minimum salaries for the respective positions, of $84,000 for a GS-7 technician and $167,000 for a GS-13 supervisor.

The bacteriological safety cabinet may be elementary [19] or elaborate [20-22] (Figures 1 and 2), depending upon the

FIGURE 2



need. It is believed that persons employing varied and sometimes new technics in the study of highly infectious organisms causing disabling diseases are entitled to the protection afforded by the cabinet, illustrated in Figure 1. For standardized operations, such as those conducted in tuberculosis diagnostic laboratories where several cabinets may be needed, simpler arrangements are often necessary for reasons of economy.* In this enclosure are carried out all procedures with infectious substances, such as: opening test tubes, flasks, and bottles, pipetting, making dilutions, inoculating, injecting or autopsying animals, grinding, blending, opening lyophile tubes, operating a sonic vibrator, etc. Mechnical pipettors are provided. The cabinet is equipped with a blower which provides a minimum air flow of 50 linear feet a minute through the rectangular opening (with the glove port panel off). Because of this air flow over the working surface, the air in the laboratory room must be reasonably clean but the cabinet need not be put in an isolation cubicle. For maximum safety the glove port panel can be put in place with or without attached gloves. The air is exhausted through a bacterial filter [2, 3] to the outside. This filter may be sterilized by incorporated electric strip heaters. Ultraviolet light provides partial disinfection of the interior of the cabinet; complete sterilization is best ac-

* The Tuberculosis Unit, PHS Communicable Disease Center, Chamblee, Ga., can provide specifications.

FIGURE 3

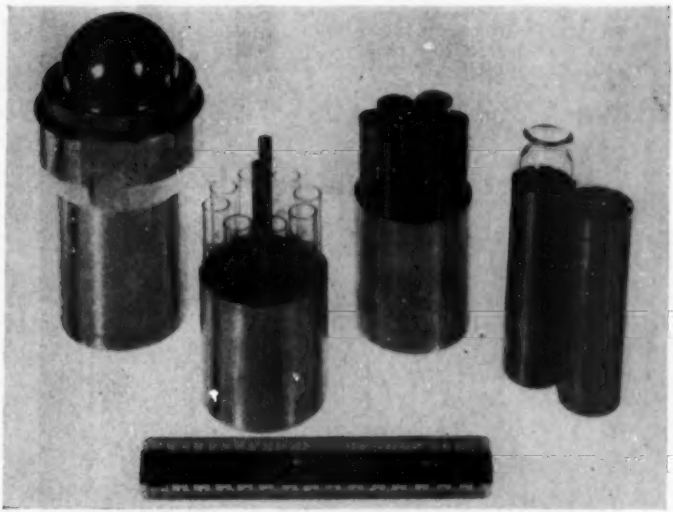
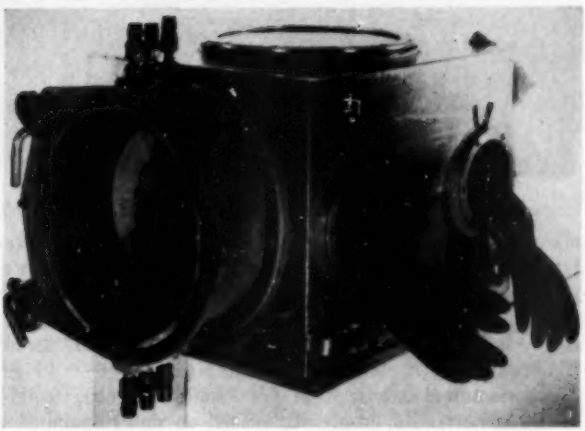


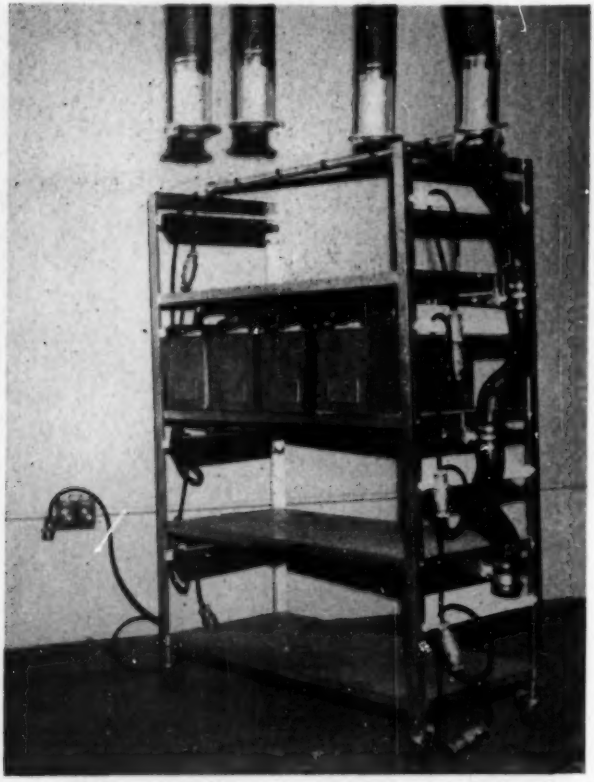
FIGURE 4



complished with steam-formaldehyde. Some idea of the effectiveness of this apparatus can be gained from item No. 4 in Table 1, where an experiment is summarized in which 2×10^6 organisms per minute were nebulized inside the cabinet for 31–96 minutes, during which time only three detectable organisms escaped from the cabinet.

The point of next greatest concern in general laboratories is the centrifuge, because of the hazard associated with

FIGURE 5

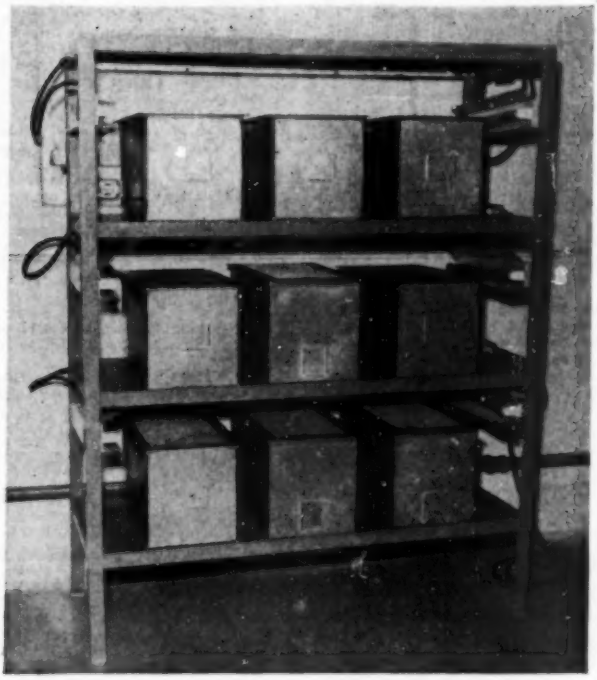


breaking tubes of culture. A screwed dome on a slotted cup is an effective safeguard (Figure 3). Although a similar dome on a trunnion carrier has been used successfully here and at the Naval Biological Laboratories in Oakland, Calif., the manufacturers advise that this weakens the carrier and is unsafe at rated speeds. Certain adaptations of this device are now under study and will soon be available commercially. The angular centrifuge head presents a more difficult problem. A special ventilated cabinet has been designed for the refrigerated centrifuge.

Shaking machines offer the third greatest problem and various solutions will be described in a later article.

The housing of infectious animals, particularly those which have been exposed to bacterial aerosols, requires ventilated cages [23, 24] (Figures 4 and 5) or solid-bottomed, solid-sided cages placed on racks equipped with high intensity ultraviolet light (approximately 250 microwatts per square cm.) (Figure 6). Animal caretakers need protective goggles. Cages should be disinfected or sterilized without disturbing debris before cleaning; the exact procedure depends upon the infectiousness of the agent.

FIGURE 6



Finally, the best equipment is ineffective if it is not accompanied by good technic.[7, 8, 25] Supervisors and senior workers must accept the responsibility for training new personnel and for insisting upon safe practices. In this connection nothing is more valuable at the outset than an appropriate safety manual. In large establishments, a laboratory safety council will increase cooperation and facilitate interchange of ideas. For some operations, certain kinds of safety equipment are indispensable. Then, adjustment of the level of precaution to the level of risk can prevent infections without unduly impeding operations.

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TABLE 1

Infectious Hazards of Common Bacteriological Technics

Technic	*Test Organisms Recovered from Air During Technic Specified* *
1. *Agglutination, slide drop technic (one slide)*	0.3
2. *Animal injections*	
(1) 10 shaved guinea pigs injected I.P. with 0.5 ml. culture, no disinfectant	15
(2) Same as (1), but injection site disinfected before and after injection with 1 per cent tincture of iodine	0
(3) Swabs of injection site of animals in (1) after 1 hour revealed leakage of organisms in 10 of 10 pigs	
(4) Swabs of injection site of animals in (2) after 1 hour revealed leakage of organisms in 3 of 10 pigs	
3. *Autopsy*	
(1) Autopsy 1 guinea pig immediately after 10 ml. culture injected intraperitoneally	30
(2) Autopsy 1 guinea pig, standard pathology technic, immediately after 1 ml. culture injected intraperitoneally	4.5
(3) Autopsy 1 guinea pig immediately after 10 ml. culture injected intracardially	3
(4) Autopsy 7 guinea pigs after 10 daily 2 ml. intraperitoneal injections of culture	0
(5) Grinding guinea pig tissue 2 minutes in mortar and pestle with 2 ml. sterile broth	
Guinea pig, as in (1)	0.2–1.8
" " " " (3)	0–19.5 †
" " " " (4)	0
	Organisms Recovered from Air Outside the Cabinet *
4. *Bacteriological safety cabinet, use of* Fifty-seven ml.–230 ml. broth culture nebulized inside cabinet in 31–96 minutes while air samplers operating outside. Linear airflow 50 feet per minute through panel openings. Condition of cabinet:	
(1) Glove port panel off	3
(2) Glove port panel on	0
(3) Glove port panel on, with operator moving hands in and out of cabinet	0
(4) As in (3) but panel was off	0

TABLE 1 (Continued)

	Test Organisms Recovered from Air During Technic Specified *
5. *Centrifuging*	
(1) Pipetting 10 ml. culture into 50 ml. tube	0.6
(2) Pipetting 30 ml. culture into 50 ml. tube	1.2
(3) Removal of one cotton plug after centrifuging	0.2–2.3
(4) Removal of one rubber cap after centrifuging	0.0–0.025
(5) Decanting supernatant into flask	17.6
(6) Siphoning supernatant from 10 tubes, each containing 30 ml. centrifuged culture	3
(7) Adding 30 ml. saline to one tube packed centrifuged cells and resuspending by mixing by alternate sucking and blowing with a pipette	4.5
(8) One 50 ml. tube breaking in centrifuge but all 30 ml. culture staying in trunnion cup	4
(9) One 50 ml. tube breaking in centrifuge and culture splashing side of centrifuge	1,183
(10) Swabbing of outside of centrifuge tubes after filling, centrifuging, taking off supernatant, and resuspending shows colonies "too numerous to count"	
(11) Operation of Standard Sharples centrifuge produced extremely high aerosol and surface counts	

6. *Drop of culture falling onto*	*Falling 3 inches*	*Falling 12 inches*
(1) Steel surface	1.5	15.78
(2) Painted wood	0.3	8.68
(3) Kem rock	0.04	..
(4) Dry hand towel	0.16	5.70
(5) Dry paper towel	0.11	0.14
(6) Dry wrapping paper	0.02	..
(7) Towel wet with 5 per cent phenol	0.02	0.73
(8) Pan of 5 per cent phenol	0.00	0.03

7. *Hypodermic syringes and needle withdrawing 1 ml. culture from rubber capped vaccine bottle*	
(1) Needle and stopper wrapped in Ceepryn soaked cotton pledget	
(a) Positive or negative pressure in bottle	0.8–16
(b) Atmospheric pressure in bottle or no adjustment	0–6.4
(2) Needle and stopper not wrapped in pledget	
(a) Positive or negative pressure in bottle	4.4–28
(b) Atmospheric pressure in bottle	0.6–19
(3) Using 70 per cent alcohol soaked pledget does not always protect fingers against contamination	

8. *Inoculating loop*	
(1) Streaking 1 agar plate with one loopful broth culture	0.06
(2) Streaking 1 agar plate with one loopful agar culture	0.26
(3) Inoculating loopful of broth culture striking edge of tube	0.60
(4) Inserting 1 hot inoculating loop into 100 ml. culture in a 250 ml. Erlenmeyer flask	6–24 ‡
(5) Inserting 1 hot inoculating loop into 100 ml. culture in a 250 ml. Erlenmeyer flask	8.7 *
(6) Inserting 1 cold inoculating loop into 100 ml. culture in a 250 ml. Erlenmeyer flask	0.8
(7) Inserting 1 hot inoculating loop into 10 ml. culture in test tube or into an agar plate	0.008
(8) Inserting 1 cold inoculating loop into 10 ml. culture or into an agar plate	0.005
(9) Insert 1 loopful of culture into Bunsen burner flame	0–0.3 **

9. *Lyophilization*	
(1) Accidentally breaking one ampoule lyophilized nutrient broth culture by dropping on floor—first 10 minutes	953
(2) The same, 50–60 minutes after breakage	51
(3) The same as (1), but using milk plus broth culture	2,029

TABLE 1 (Continued)

(4) The same as (2), but using milk plus broth culture	741
(5) Opening one lyophile tube not wrapped in cotton pledget by filing and breaking tip	12–86 ‡
(6) The same as (5), but wrapped in dry cotton pledget	0.08–1.64 ‡
(7) The same as (6), but wrapped in 70 per cent ethanol soaked cotton pledget	0–0.08 ‡
(8) Transferring 1 dry inoculum from one lyophile tube to one broth tube by wire loop	0.04–1.0 ‡
(9) The same as (8), but shaking the powder into the tubes	0.3–5.4 ‡
(10) The same as (8), but wet inoculum transferred by syringe and needle after reconstituting with 1 ml. broth	0–4.4 ‡
(11) Swabs show recovery of organisms from hands, lyophilizer rubber sleeves, manifold outlets, condenser, connecting arm to vacuum pump; not on pump exhaust port	
10. *Petri plates*	
(1) Open Petri plates with 20 ml. 1–10 dilution of 24-hour broth culture, undisturbed	0.0
(2) Preparation of pour plate, pipetting 1 ml. inoculum into plate without blowing, and adding melted agar and mixing	2.6
(3) Preparation of pour plate, adding and mixing 15 ml. melted agar in plates already containing 1 ml. inoculum	0.1
(4) Streaking one smooth agar plate with 1 loopful broth culture	0.06–4.6 ‡
(5) Same as (4), but 0.1 ml. streaked with glass rod	0.06
(6) Same as (4), but using 1 loopful agar culture	0.26
(7) Streaking one rough agar plate with 1 loopful broth culture	25.1
(8) Same as (7), but using 0.1 ml. and a glass rod	8.7
11. *Pipettes*	
(1) Pipetting 10 ml. culture into 50 ml. tube	0.6
(2) Pipetting 30 ml. culture into 50 ml. tube	1.2
(3) Inoculating 50 ml. broth in 125 ml. Erlenmeyer flask with 1 ml. culture	1.2
(4) Inoculating 1,000 ml. broth in 2,000 ml. Erlenmeyer flask with 10 ml. culture	2.4
(5) Mixing 7 ml. broth culture by alternate suction and blowing, without forming bubbles	0.2
(6) Mixing as above, but forming bubbles	0.8
(7) Pipette, drained of culture, discarded into cylinder of disinfectant	0.36
(8) Pipette, drained of culture, discarded into pan of disinfectant	0.44

12. *Plug, stopper, or cap removed from culture container of 1–10 dilution of 24 broth culture of Serratia indica*	*Range*	*Average* *
(1) Escher rubber stopper removed from 5-oz. square dilution bottle immediately after shaking up and down	0–20	5.0
(2) The same, but stopper removed very carefully	0–14	4.5
(3) The same as in (1), but removed after 30 seconds wait	0–12	2.5
(4) Plastic screw cap removed from 8-oz. prescription bottle immediately after shaking	0–13	4.0
(5) Same as in (4), but removed after 30 seconds wait	0–15	4.0
(6) Cotton plug removed from 250 ml. Erlenmeyer immediately after rotary shaking (dry plug)	0–16	5.0
(7) Same as in (6), but removed after 30 seconds wait	0–12	2.5
(8) Cotton plug, wet with culture, removed quickly from culture tube		10.2
(9) Cotton plug, wet with culture, removed slowly from culture tube		6.8
(10) Cotton plug, dry, removed from culture tube		0.0
(11) Removing one dry cotton plug from test tube of culture after centrifuging (Technician A)		2.3
(12) The same as (11), (Technician B)		0.2
(13) Removing rubber cap as in (11), (Technician A)		0.0
(14) Removing rubber cap as in (11), (Technician B)		0.025

TABLE 1 (Continued)

13. *Pouring*	
(1) Pouring 7 ml. culture in tube into a similar vertical empty tube	1.6
(2) Pouring 7 ml. culture in tube into a 250 ml. Erlenmeyer flask at a 45° angle	0.8
14. *Staining Serratia indica* with Gram's, or crystal violet, or safranine, or methylene blue and then putting the slide in broth yielded *growth*	
15. *Ventilation of room*	
(1) Time for 7.7 air changes per hour room ventilation to eliminate bacterial aerosol from room air (bacteria are still viable on surfaces)	(45–50 minutes)
(2) Time if no ventilation	(135–150 minutes)
16. *Waring blendor, culture mixed 2 minutes*	
(1) Screw-capped, no rubber gasket, 1 minute	8.7
(2) Screw-capped, rubber gasket, worn bearing	61.0
(3) Loose fitting plastic cover	18–518
(4) Removing tight cover immediately after mixing	Too numerous to count
(5) Removing tight cover 1 hour after mixing	8.2

* Figures represent averages of many tests
† Average, depending on the tissue
‡ Various technicians
** Average, depending on technic and medium in the loop
§ Average, depending on medium and culture in lyophile tube

Massachusetts Revises Union Law

The 1949 Health Union Act was amended by the 1953 session of the Massachusetts Legislature. The mandatory feature by which towns of less than 35,000 population must join a health union by 1959 unless they meet minimum health standards was removed. Approval of the State Health Department for the formation of a district and of the qualifications of the district health officer is no longer required; placing district health employees under civil service is optional rather than mandatory, and no minimum health standards are required. Other changes have to do with representation, financing, and state assistance.

This is the first published report of the successful use of the membrane filter to demonstrate the presence of the typhoid bacillus in a well in America.

Isolation of *Salmonella typhosa* from Well Water by the Membrane Filter Technic

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IN early April of 1953, our department was called upon to investigate a case of suspected typhoid fever in a family living in a semirural addition, near the town of Pataskala in Licking County, Ohio. Ultimately, nine cases of typhoid fever were discovered in three families. *Salmonella typhosa*, bacteriophage type A, was isolated from blood cultures and from stool specimens of these patients, and typhoid O and H agglutinin titers were obtained on blood samples. Epidemiological investigations by the Communicable Disease Division indicated the source of the infection to be water from a dug well. This well was located at the home of a woman who had recently entered the addition and who was found to be a typhoid carrier. Routine bacteriological examination demonstrated coliform contamination. The membrane filter technic was then employed to isolate typhoid bacilli from this well water and incriminate it as a source of infection.

The well which contained *S. typhosa* was 25 feet deep, of tile construction, and was located nine feet from the back porch of the dwelling. Surface washing was considered to be the most likely source of the heavy contamination discovered. Dishwater and handwashing water were regularly thrown on the ground in the vicinity of the well and it could have drained through the wooden cover and cracked tile casing. On rainy days the well water was said to be turbid. A poorly constructed privy was located 100 feet from the well, and although it was slightly downhill, it could not be entirely disregarded as a source of contamination.

Following the researches of Goetz [1] in designing filtration equipment and an improved membrane, Clark, *et al.*,[2] and Kabler and Clark [3] reported on uses of the membrane filter in sanitary bacteriology, with particular reference to bacterial counts and to quantitative estimations of the coliform group. Description also was made of the utilization of a commercially dehydrated bismuth sulfite broth * in the recovery of typhoid bacilli from artificially inoculated water samples. Mueller [4] had previously cultured typhoid organisms from the Hamburg public water supply, from the water supply on a ship, and from three wells. She used a modified bismuth sulfite broth for culture of water samples filtered through nitrocellulose membranes.

EXPERIMENTAL

Preliminary tests with water artificially inoculated with *S. typhosa*

* Difco Laboratories, Inc., Detroit, Mich.

TABLE 1

Presence of Coliforms and Typhoid Bacilli in Well Water Samples

Sample Number	*Date Collected*	*Date Tested*	*Well Source*	*Ml. Water Through Membrane Filter*	*Typhoid Result*	*Coliform Potability*
1	4/3	4/6	A	10, 50, 100	Negative	Unsafe
2	4/3	4/6	B	10, 50, 100	Negative	Unsafe
3	4/8	4/13	A	10, 50, 100, 500	Negative	Unsafe
4	4/16	4/16 *	A	50, 100, 100, 500	*Salmonella typhosa* all quantities	M.P.N. 330/100 ml. Filter 390/100 ml.
5	4/21	4/21	C	50, 100, 500	Negative	Previously satisfactory
6	4/21	4/21	D	50, 100	Negative	Previously unsafe
7	4/21	4/21	D after pumping	50, 100, 200	Negative	Previously unsafe

* Tested within three hours of collection

showed that typical colonies developed on the membranes, when incubated with Bacto M-Bismuth Sulfite Broth, pH 7.7. The characteristic halo, metallic sheen, and black colony color were present only in relatively uncrowded areas of the membrane.

Seven samples of water from four wells in the epidemic area were subjected to membrane filter tests for typhoid, and *S. typhosa* was isolated from one of three water samples from the most highly suspected well (well "A"). Table 1 shows the results obtained with the various samples. The method employed is described below.

Three or four quantities of 10–500 ml. amounts of each water sample were filtered through separate membranes. It was not possible to filter more than 100–500 ml. of a given water because of matting of particulate material on the filter. After filtration each membrane was lifted off the filter and layered on a sterile nutrient absorbent pad saturated with approximately 2.1 ml. of double strength bismuth sulfite broth in a 60 mm. diameter Petri dish. Dish-membrane cultures were incubated at 37° C. in an atmosphere of saturated humidity for 40–48 hours.

Typhoid colonies began to darken at 24 hours, but sheens and black-brown halos were not well developed before 40 hours. No coliform colonies which could be confused with those of typhoid bacilli were found.

Suspicious colonies were fished to triple sugar iron agar slants and were identified by the usual procedures which included agglutination of the unknown organism or its extract with polyvalent Salmonella antiserum, and antisera to group D, flagellar "d" and Vi antigens. Bacteriophage typing, performed by the Michigan Department of Health Laboratories, revealed that the culture of *S. typhosa* from the well was of type A, as were those isolated from the patients. The cultures indicated that the well in question contained at least one typhoid organism per 50 ml. of water, although the concentration was possibly greater, as crowded conditions on some of the membranes may have inhibited the development of typical colonies.

Water sample No. 4 from which *S. typhosa* was isolated was retested after four days refrigeration, and typhoid bacilli were no longer recovered. This time factor may explain failure to grow *S. typhosa* from samples Nos. 1 and 3,

and may indicate that only freshly collected water should be used for this test.

The survival time of typhoid organisms in natural waters is by no means definite. Tanner's review [5] of the literature would indicate that the usual time of survival is from three to ten days, but that it may extend to four weeks or more, depending upon various conditions.

To our knowledge, *S. typhosa* has not been isolated previously from natural water in America by membrane filter technics.

SUMMARY

Salmonella typhosa, bacteriophage type A, was isolated from the water of a dug well by the membrane filter technic.

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A note for laboratory workers on the cultivation of the diphtheria bacillus.

Further Studies of Tellurite Plating Media for *Corynebacterium diphtheriae*

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IN a previous paper [1] the results of a study of seven different tellurite plating media for the routine isolation of *Corynebacterium diphtheriae* were reported. At that time it was found that two of the media tested (cystine-tellurite-blood agar and chocolate-blood-tellurite agar) gave results which were superior to those obtained with other media tested. The data for these two media, while similar, seemed to suggest that one might be slightly better than the other. The comparative study was, therefore, continued in order to determine more clearly their relative values. The purpose of this paper is to report the completed findings.

EXPERIMENTAL

The material used in this part of the study was obtained from the routine field cultures received from the Georgia Department of Public Health Laboratory. These throat cultures were on Loeffler's medium and came to this laboratory after their routine examination had been completed. All technical details were carried out in the same manner as previously described.[1]

RESULTS

Table 1 summarizes data previously published (Series A) and shows numbers of cultures streaked on the two media under consideration, together with the number of isolations of *C. diphtheriae* made with each. Table 2 shows the same data for the continued study (Series B). In Series A, 15.7 per cent of the cultures yielded *C. diphtheriae* on cystine-tellurite-blood agar and 16.7 per cent on chocolate-blood-tellurite agar

TABLE 1

Isolation of C. diphtheriae on Two Different Tellurite Media (Series A).

Medium	*Cultures Plated*	*Isolations*	
		Number	*Per cent*
Blood-cystine-tellurite	637	100	15.7
Chocolate-blood-tellurite	634	106	16.7

TABLE 2

Isolations of C. diphtheriae on Two Different Tellurite Media (Series B).

Medium	*Cultures Plated*	*Isolations*	
		Number	*Per cent*
Blood-cystine-tellurite	525	204	38.8
Chocolate-blood-tellurite	525	215	40.9

TABLE 3

Isolations of C. diphtheriae on Two Different Tellurite Media (Series A + B).

Medium	Cultures Plated	Isolations	
		Number	Per cent
Blood-cystine-tellurite	1,162	304	26.1
Chocolate-blood-tellurite	1,159	321	27.6

TABLE 4

Cultures Positive and Negative for C. diphtheriae on Two Different Tellurite Media.

Series	Positive cystine-tellurite Negative chocolate-tellurite		Negative cystine-tellurite Positive chocolate-tellurite	
	Number	Per cent	Number	Per cent
A	11	1.7	17	2.6
B	9	1.7	20	3.8
A + B	20	1.7	37	3.2

medium. In Series B, 38.8 per cent isolations were made on the cystine-tellurite-blood agar and 40.9 per cent on the chocolate-blood-tellurite agar medium, a difference of 2.1 per cent.

In Table 3, data from the two series have been combined. Of 1,162 cultures streaked on the cystine-tellurite-blood agar, 304 (26.1 per cent) were positive. Of 1,159 plated on the chocolate-blood-tellurite agar medium, 321 (27.6 per cent) were positive, a difference of 1.5 per cent. Table 4 shows the number of cultures which were found to be positive on one medium and negative on the other, in Series A, and in B, and in the combined series. In all cases slightly more cultures were found to be positive on chocolate-blood-tellurite agar and negative on cystine-tellurite-blood agar than vice versa.

DISCUSSION

In choosing a satisfactory tellurite-containing plating medium for the routine isolation of *C. diphtheriae*, all of the media containing whole blood were shown to be more satisfactory than those containing serum only.[1] While the percentage of isolations obtained with the chocolate-blood-tellurite agar medium is somewhat greater than the percentage obtained with the cystine-tellurite-blood agar, this difference is not significant statistically. Both may be considered superior media for their purpose. The personal factor will undoubtedly weigh heavily in the choice between these two media, since the character of the growth on each is quite different. Some will prefer the almost clear cystine-tellurite-blood agar medium to the opaque chocolate-blood-tellurite agar. The chocolate-blood-tellurite agar medium is a little more troublesome to prepare than the cystine-tellurite-blood agar medium.

SUMMARY

Comparison between two tellurite-containing blood media for the routine isolation of *C. diphtheriae* from throat cultures has been made on the basis of about 1,160 cultures streaked on each. The larger number of isolations obtained with the chocolate-blood-tellurite agar medium is of no statistical significance. Both media are recommended.

ACKNOWLEDGMENT—The authors wish to acknowledge the kind cooperation of the staff of the Georgia Department of Public Health in supplying and studying the cultures used in this work.

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If we continue to do all that we are now doing, but do it better, the venereal diseases can be brought down to that irreducible minimum that is a practical goal for public health administration.

Venereal Diseases—Present and Future*

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IT is the purpose of this article to review the present status of the venereal diseases and then, in the light of our present knowledge and experience, attempt to outline a sensible course of action for the future.

The venereal diseases are so called because the principal mode of spread is through sexual relationships. They are five in number—syphilis, gonorrhea, chancroid, granuloma inguinale, and lymphogranuloma venereum. The future will decide whether or not, to this list, should be added the ever-increasing nongonococcal urethritis in which frequently there is elicited a history of sexual exposure. This condition alone is seen in about 40 per cent of male patients with urethritis examined in our clinics.

In the United States there has been a steady decline, beginning with 1948, in the reported cases of gonorrhea and syphilis among the civilian population (Figure 1).[1] For example, in 1948 there were 338,141 cases of syphilis reported, an annual rate of 234.7 per 100,000, whereas in 1952 a total 168,734 reports of syphilis were received, an annual rate of 110.8 per 100,000. This represents a rate decline in reported syphilis of approximately 52.8 per cent. The same year, 1948, saw also the beginning of a steady decrease in the reported cases of gonorrhea from 363,014, a rate of 252 per 100,000, to 245,220 in 1952. This latter represents a rate of 161.1 per 100,000 with a 36.1 per cent rate decrease over 1948.[2]

A closer examination of the reported decrease in syphilis is in order. It can be seen (Figure 2) that the sharpest drop occurred in the reported cases of lesion syphilis, the primary and secondary stages of this disease. Here also the decline began in 1948 with 81,428 cases reported, a rate of 55.9 per 100,000, and in 1952 there were 12,447 primary and secondary lesion cases reported, a rate of 7.9 per 100,000. This represents a rate decline of 85.9 per cent.

Next in order of decline was early latent syphilis which fell from the reported 101,339 cases in 1948 to 40,646 in 1952. Thus, if the primary and secondary stages as well as the early latent stage of syphilis are considered together, then the decline in infectious syphilis, which began in 1948, was from 123.8 per 100,000 to 33.1 per 100,000 in 1952. This, therefore, represents a rate decline for infectious syphilis of 73.3 per cent.

Beginning two years later in 1950, and dropping off more slowly, were the late and late latent stages of syphilis. The rate dropped from 75.5 per 100,000 in 1950 to 66.9 per 100,000 in 1952, a rate decline of 11.4 per cent.

The next to fall was congenital

* Address presented before the New England Health Institute at the University of Rhode Island, Kingston, R. I., June 12, 1953.

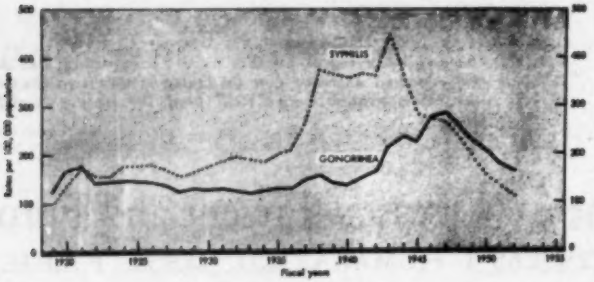

FIGURE 1—Syphilis and gonorrhea cases reported per 100,000 population, based on reports from state health departments—Continental United States (Military cases included 1919–1940, excluded thereafter)

syphilis. It, too, began its steady decline in 1950 with a rate of 9.0 per 100,000 and in 1952 it reached the rate of 6.1 per 100,000, a rate decline of 32.2 per cent.

While these are the reported cases and rates for gonorrhea and syphilis, do they actually represent the true incidence of the diseases? Hardly so, because in many instances syphilis is not found until it has progressed to one of the late stages, thus representing a missed early case of this disease. Often enough the disease may escape detection completely. Gonorrhea in the female is often more difficult to detect, both by the patient and the physician. For both gonorrhea and syphilis, there is the increasing problem of incomplete reporting. So, what is the true incidence of these diseases? The best estimate indicates that for the year 1952 there were 110,000 new cases of syphilis. The incidence of gonorrhea is felt to be at least five times the incidence of syphilis. This estimate may have to be revised upward.[3] As far as prevalence for syphilis is concerned, it has been estimated that

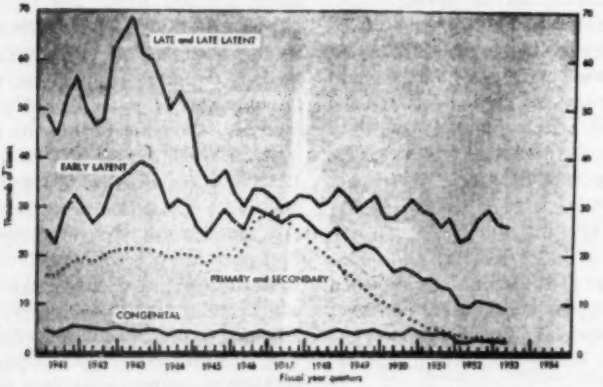

FIGURE 2—Cases of syphilis reported by states and territories, by stage—Continental United States (Known military cases excluded)

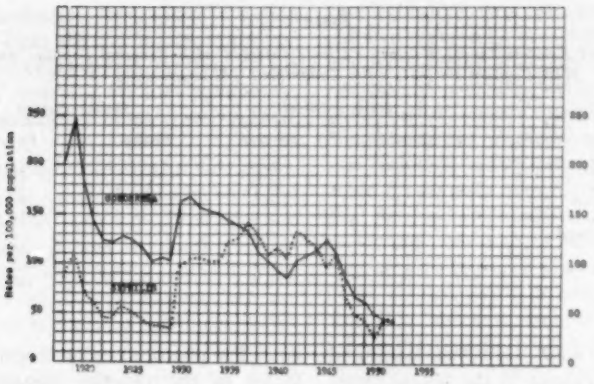

FIGURE 3—Syphilis and gonorrhea cases reported per 100,000 population, Massachusetts, 1918–1952

for the year 1952 there were 2,100,000 persons in the United States requiring treatment for this disease.[2]

Our experience in Massachusetts parallels the national picture, in that there was a decline in the reported cases of gonorrhea which began with the year 1948 (Figure 3). Syphilis, too, began to decrease that same year, but unlike the experience of the country as a whole an increase appeared with the year 1951 and continued during 1952. The earlier reduction in this disease was influenced primarily by a decline in infectious syphilis, while the increase of the past two years was essentially due to an increase in the discovery and reporting of late and late latent syphilis (Figure 4).

Admittedly, the morbidity reporting of gonorrhea and syphilis leaves much to be desired. Yet, even though this fact is taken into consideration, it is obvious that there has been an actual reduction in both gonorrhea and syphilis.

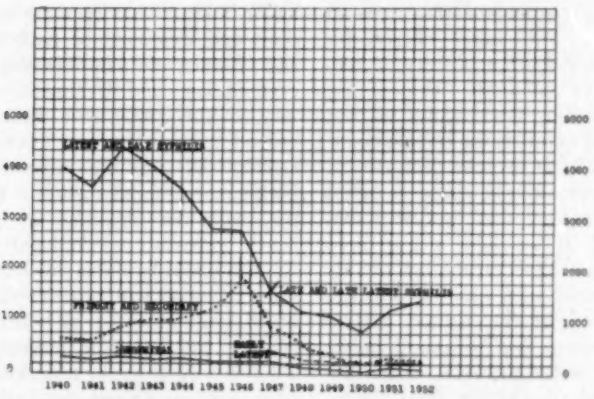

FIGURE 4—Cases of syphilis reported in Massachusetts, by stages, 1940–1952

TABLE 1

Contact Relationship of Military Patients Infected with Venereal Diseases and Male Civilian Patients with Gonorrhea. (Massachusetts—1952)

	Military Patients		Civilian Patients	
	Number	Per cent	Number	Per cent
Pick-up	667	69.0	442	55.1
Friend	203	21.0	221	27.5
Prostitute	61	6.3	50	6.2
Marital	28	2.9	84	10.5
Homosexual	8	0.8	5	0.6
Other			1	0.1
Total	967	100.0	803	100.0

To what is it due? Can it be attributed to a radical change in the sexual mores of our people, since gonorrhea and syphilis are diseases of sexual promiscuity? One hardly thinks so, and for the following reasons: (1) Nationally the illegitimate birth rate is said to be 4 per cent of our total live births. In Massachusetts, in a report of the first 1,005 deliveries which were part of our prenatal syphilis study, 4 per cent of the mothers admitted they were single.[4] If 4 per cent of the mothers admitted they were single, how many more of the series were illegitimately pregnant? (2) It has been reported that 35–50 per cent of the married men in the United States have had extramarital relations while they were still married.[5] (3) The national divorce statistics continue to augment and perpetuate the cycle of promiscuity. The basic causes for divorce are found in immaturity, incompatibility, and infidelity. One of the factors promoting promiscuity in our teenagers and adults is the broken home. (4) In the field of juvenile delinquency, the third most common cause of arrest in females in 1952 was "sexual activities."[6] (5) If we take a leaf from economics and reflect on the law of supply and demand, then why has prostitution decreased in the United States? Law enforcement and organized public opinion are partial answers. More important is the competition from the increasing, noncommercialized promiscuity. The prostitute is no longer a major factor in the venereal disease control problem. She has been replaced by the amateur (Table 1).

It is true that following World War II and with the return of more normal living, one would expect that there would be some reduction in sexual promiscuity. Indirect evidence indicates that such was the case. However, it is obvious that there has been no fundamental change for the better in the sexual mores and habits of our American people.

The basic causes in the reduction of both gonorrhea and infectious syphilis can be seen as a result, first, of the organization and efficient functioning of venereal disease control activities throughout the United States. Our major objective has been the early diagnosis and treatment of both gonorrhea and syphilis, and identification, location, examination, and treatment, if necessary, of the contacts of these patients. Second, the effect of penicillin is rapidly reducing the infectiousness of both gonorrhea and syphilis. For example, with one injection of penicillin, acute gonorrhea is rendered noninfectious in about two hours or less, and the same injection will cure 95–98 per cent of all acute cases in 24 hours. Lesion syphilis will be made noninfectious in 24 hours by a single injection of penicillin, and an 85 per cent cure rate, or higher, can be expected with one course

of this antibiotic. The speed of action resulting from efficient organization and therapeutic effectiveness has reduced the infectious reservoir in the community, thereby preventing other cases of these diseases.

The modern antibiotic era has revolutionized the clinical management of gonorrhea and syphilis. Penicillin is a specific and potent antibiotic in the treatment of gonorrhea and syphilis. But of what value is it if patients are not located and brought to treatment before they have the time and opportunity to spread the infection to others? Penicillin has created some new problems, and left others unsolved.

Today, the speed and simplicity of treatment have transferred the organization of venereal disease clinic services from inpatient to outpatient care. In Massachusetts, our 24 clinics are centered (with 4 exceptions) in the outpatient departments of general hospitals as part of the dermatologic, medical, genitourinary, or gynecological clinic services, in accordance with the structure and organization of each hospital's outpatient department.

Modern diagnostic methods have not kept pace with—but have actually lagged behind—the speed of therapeusis. It frequently takes a longer time to diagnose than to cure. As an administrative and clinical expedient, male patients with an urethral discharge, and female contacts of gonorrhea, are examined, smears and cultures prepared, blood tested, and an injection of penicillin given at one sitting. The smear is read and reported on within 30 minutes, but the results of the culture and blood test are not available for at least 24 hours. If the smear is positive, the patient is immediately interviewed as to contacts, for in the male with acute gonorrhea a positive smear is approximately 98–99 per cent specific. It is not as reliable in the female. Female contacts of gonorrhea, with negative clinical and laboratory data, already treated as outlined previously, are classified as "not infected, treated prophylactically." The low cost of penicillin, the relatively low sensitivity of smears and cultures in the female, and the efficiency and safety of this antibiotic justify prophylactic treatment of sexually promiscuous females. The diagnosis of syphilis is more time-consuming unless the clinician is fortunate enough to find a positive dark-field in a patient with suspicious lesions. Thus, the speed of treatment and cure leaves the patient with syphilis hardly the chance to develop any active immunity. Very little, if any, active immunity appeared in patients with gonorrhea even in the pre-sulfa days. However, reinfection in both is common and the terms "ping-pong gonorrhea" and "ping-pong syphilis" have been coined to describe the infections resulting from posttreatment exposure, usually with the same pretreatment partner.

From the public health point of view the speed of treatment gives the interviewer hardly a chance to get acquainted with the patient in order to obtain the names and addresses or descriptions of his or her sexual partners. It makes the job of rehabilitation, except in the case of syphilis, practically hopeless. The fear of contracting gonorrhea and syphilis is no longer a serious deterrent for sexual promiscuity, and the fear of pregnancy has been minimized by the wide availability of contraceptive information.

The ease of clinical management and the relatively low cost of treatment have placed more and more patients under the care of the family physician—and rightly so. However, private medical care has accentuated the problem of nonreporting either because no diagnosis was established (too hasty use of penicillin), or, if one was made, the doctor neglected to report it. On the national scale, this increasing failure to report cases on the part of private physicians can be appreciated by a glance at

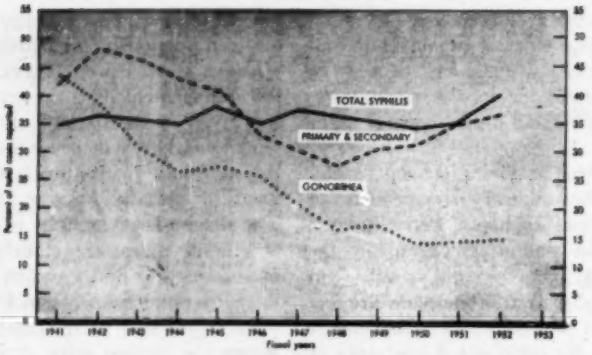

FIGURE 5—VD morbidity reported by private physicians as a percentage of total cases reported by disease and stage—Continental United States

Figure 5 where the proportion of total cases of gonorrhea reported by private physicians has become less and less, as more and more of these patients go from clinic to general practitioners' care.

In Massachusetts, our experience with the problem of nonreporting paralleled that of the rest of the country until 1951 when—with the endorsement of our State Medical Society—a program was launched to gain the doctors' cooperation. That year, for the first time in the history of Massachusetts, more than 50 per cent of the total syphilis reported came from private physicians (Figure 6). The percentage increased in 1952. However, our physicians reported proportionally less and less gonorrhea until 1952 when the downhill trend stopped and an increase was noted. It is felt that the recent increase is a reflection of our program, started in 1951 for better morbidity reporting of syphilis.

Contact interviewing and investigation have also suffered in this transition. Doctors in private practice are busy. They do not have time to interview patients for contacts, let alone to carry

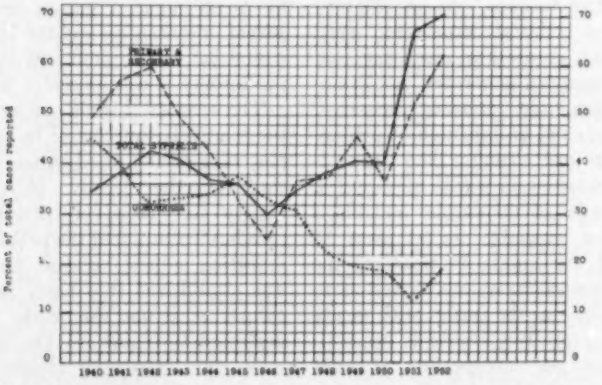

FIGURE 6—VD morbidity reported by private physicians as a percentage of total cases reported by disease and stage, Massachusetts

out the contact tracing. Doctors are first to admit that many do not have the interest or the skill to do effective interviewing. And it is not surprising. Interviewing and contact tracing require specific talents. Not everyone in public health work, nor even everyone in venereal disease control work, has these talents.[7] Careful training is helpful. Trained interviewers are able to obtain more contacts and to secure more usable information than untrained interviewers.[8, 9] Thus, the results of contact investigation will vary, other factors being equal, with the adequacy or inadequacy of the contact interview.[10]

In Massachusetts less than 5 per cent of all contacts reported came from private physicians. Therefore, there is need to have our doctors aware, and react to the fact, that for every case of gonorrhea and syphilis they diagnose and treat, there must be at least one infected contact of his patient in the community. Most patients have several contacts. If the doctor does not have time to interview his patients for contacts, he should have access to and be encouraged to use the services of trained, diplomatic interviewers of his health department. Without this cooperation on the part of the private physician, the venereal diseases will never be controlled.

In considering the future of the venereal disease control program, one should first define his objectives. Is eradication of these diseases our aim? Or, is it our purpose to reduce them to that level which statisticians call the irreducible minimum? The first objective cannot be accomplished. It is impossible to eradicate the venereal diseases with the present methods of control. The entire control program rests fundamentally on early diagnosis and treatment; that is, case finding and treatment. Case-finding technics have inherent limitations apart from their application. For example, screening devices for case finding apply only to syphilis. There is no cheap or simple laboratory test adaptable to mass or selective population groups for gonorrhea or the minor venereal diseases. Even in screenings for syphilis, the blood test has inherent limitations. For example, it will miss all cases of sero-negative primary syphilis, 5–10 per cent of active late benign syphilis, up to a maximum of 33 per cent of patients with tabes, and 10–20 per cent of patients with cardiovascular syphilis.

The second method of case finding is through education with the aim of motivating individuals who have exposed themselves to seek early medical care. Health education as a case-finding tool will work better in males than in females, principally because the signs and symptoms of gonorrhea and primary syphilis are not so apparent to the female patient.

Contact investigation represents the third and the most effective available method for case finding. Here, one begins with an infected patient. By skillful, tactful, and persuasive interviewing, one attempts to elicit the names of those contacts to whom the patient was exposed during the time period covered by the maximum incubation period of his disease, and those whom the patient has exposed since the onset of his symptoms.[11] Once the information has been obtained, the search for the contacts begins, and when found, they are examined and treated if infected. One can sense the limitations and difficulties of this method of case finding—limitations due to the skill and personality of the interviewer, limitations because of the varying attitudes of the patients, mental ability, etc. Yet it is the best case-finding method available. For every 20 persons seeking medical care on their own initiative only one new case of syphilis is found. But for every two contacts of early syphilis examined, a new case of syphilis is diagnosed.[12]

The diagnosis of gonorrhea and syphilis is not always easy. Cases may be missed because of the low index of suspicion on the part of the physician or because of the limitations of laboratory tests, etc.; but treatment is effective. Treatment failures in acute gonorrhea occur in only 2–5 per cent of the patients, but retreatment will give a 100 per cent cure. This implies adequate posttreatment follow-up. In syphilis, most of the relapses will occur during the first year, and practically 99 per cent within the first two years. A 5–15 per cent retreatment rate can be expected.

The importation of new cases of venereal diseases from abroad is another obstacle to elimination. However, present methods of venereal disease control, even if they were available and applied over the world (which they are not), would by their very nature not be sufficient to eradicate the venereal diseases.

Do our preventive methods offer any hope of eradication? Hardly so. While organized prostitution in some areas of the United States is said to have reached the irreducible minimum, this is by no means so throughout the country. Noncommercialized promiscuity is certainly not under control, nor can it be controlled effectively by legal means alone. Sex education, or education for family living, offers a hope of reducing sexual promiscuity; it will not eradicate promiscuity, but it requires coordinated effort on the part of the home, church, school, and community in the character training and formation of our youth.

Chemical, mechanical, and antibiotic methods of prophylaxis, apart from the legal, moral, and ethical considerations, cannot be relied upon to control the venereal diseases—let alone permit their eradication.

These, therefore, are our measures for the prevention and control of the venereal diseases. One notices that there is no method of artificial immunization, as in smallpox, yellow fever, etc. There is no way of attacking the organism apart from treating the patient. There is no intermediate host. The infectious reservoir is in the group of missed and undiagnosed cases and the treatment failures.

Since eradication of the venereal diseases is not a practical objective, there remains their reduction to the irreducible minimum. This stage has not been reached in the United States.

It will, then, be necessary to maintain our venereal disease control services, because, as the cases become fewer, it will be harder and require greater skill to find them. Health departments need to provide contact interviewing and investigation services both for the private physicians and for their own clinics.

The indigent and medically indigent will always be with us. Health departments will have to provide diagnostic and treatment care for them. The organizational pattern of this medical care should be in tune with modern and future therapy. Thus, today, and for the foreseeable future, it appears that gonorrhea and syphilis will be treated on an ambulatory basis. Even if the gonococcus or spirochete develop penicillin resistance in the future (and none have as yet) or sensitivity reactions should rise from the present 1–2 per cent [13] to such alarming proportions that pencillin must be discarded, there still remains a reservoir of antibiotics which can be used in ambulatory treatment. Therefore, clinic services must be arranged for population groups on a regional basis depending on the case load, centers of transportation, marketing, etc. These clinics may be located in the OPD of general hospitals as part of the dermatologic, medical, genitourinary, or gynecological clinics in accordance with the existing outpatient patterns in the area.

A skillful interviewer, who may also do the contact investigation, is necessary

at each clinic session to interview new patients, reinterview others, and maintain rapport.

These OPD centers may be used as consultation and teaching areas for private physicians and students. Particularly, will they be of invaluable assistance in the problems of nongonococcal urethritis and the biologic false-positive blood tests. In addition, they should carry out applied research, especially in the field of diagnosis and treatment.

SUMMARY

Tremendous strides have been made in the field of venereal disease control, resulting in a marked reduction in reported cases of infectious syphilis and gonorrhea. These gratifying results have been due, principally, to efficient organization and execution of venereal disease programs in the United States and the effect of penicillin speedily reducing the period of infectiousness in the patient. Present-day clinical management has caused a shift back to ambulatory treatment. The relatively low cost of treatment has brought patients more and more to private medical care. The speed and ease of treatment have created problems. Reinfections are common. The "interviewer" must attempt to get all the patient's contacts at the first interview, particularly in gonorrhea. The problem of nonreporting on the part of private physicians has been greatly accentuated. Doctors do not have the time to interview patients for contacts; therefore, health departments should offer the services of trained interviewers to private physicians.

Present-day control methods will not eradicate the venereal diseases. Our objective is their reduction to the irreducible minimum. This objective has not been reached in the United States.

Diagnostic and treatment care at the present time, and in the immediate future, should be geared to ambulatory medical care. Outpatient centers of general hospitals should be utilized for the care of the medically indigent. Here, the contact interviewers and investigators will have the opportunity to interview their patients. These clinics can also serve as consultation and teaching centers, as well as centers for applied research, particularly in diagnostic and treatment fields.

The problem of sexual promiscuity has as yet to be solved. There needs to be organized and coordinated efforts on the part of the home, church, and community to train and fashion the character of our people and particularly our youth. There will always be an infectious reservoir of venereal disease in the community. The sexual mores of our people will determine whether this reservoir will increase or decrease. If control efforts are relaxed, and the present level of sexual promiscuity persists, one can safely predict epidemics of these diseases in the future.

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Two findings make this paper of interest to many workers in the public health field in addition to the group to whom it was addressed. In a two-year, city-wide application the APHA's "Appraisal Method for Measuring the Quality of Housing" again proves its usefulness. A health department sanitarian successfully represents all municipal law-enforcing agencies in a concerted attack on substandard housing.

Housing Supervision in a Local Health Department*

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CITIES in the West are gradually "becoming of age." As far as eastern cities are concerned they are very young. As far as European cities are concerned, cities in the western United States are mere children. But San Jose is now over 100 years old and a number of its buildings, still in use, are over 50 years of age. Many factors have combined to react favorably upon housing in the West. It is still a new country and can profit by the errors of older cities. Growth has been rapid, especially in the last 10 or 12 years (San Jose's population in 1940 was 68,457; in 1950—95,020; and in 1952—102,148, all official United States censuses). There has been a demand for housing, so that it is profitable to keep rental housing in good condition. Land values are generally higher than they have been in the past and thus it is profitable to demolish older buildings or renovate those that can be improved. Then, how can there be a housing problem?

PROBLEM

San Jose is a fairly typical western city. Large, older residences have been converted into apartment houses and rooming houses. San Jose State College is located in the heart of the city with 6,000 students, most of whom demand housing during the academic year at as low a figure as possible—consistent with health and safety. San Jose is a convention city, a fact which necessitates housing for a few days for many persons from out of town. Last year 89 conventions were held with an attendance of 27,520 persons.

INSPECTION SERVICES

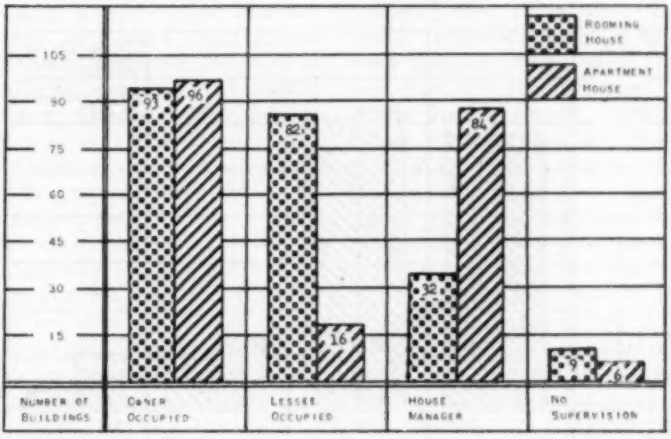
Many inspectors entering the same premises for various reasons, such as fire, building, plumbing, electrical, police, and health, irritated the taxpayer and gave inefficient service. Less complicated, more centralized, and useful inspection services had to be worked out.

LAWS

State laws formed a broad base on which the more restrictive local housing ordinances could be built. Provision was made in these laws that the Health Department should be responsible for housing in this city. The Municipal Code imposed upon the health officer the responsibility for enforcing provisions

* Address presented before the Seminar on Hygiene of Housing, sponsored by the California State Department of Health, Asilomar, California, April 17, 1953.

CHART 1—Type of Management in 216 Rooming and 202 Apartment Houses



This chart illustrates that about 96 per cent of apartment houses and rooming houses in San Jose are under supervision of owners, lessees, or house managers. Although this appears to be a highly satisfactory percentage, the quality of supervision is of utmost importance. Faulty supervision accounts for many of the basic deficiencies shown on the charts which follow.

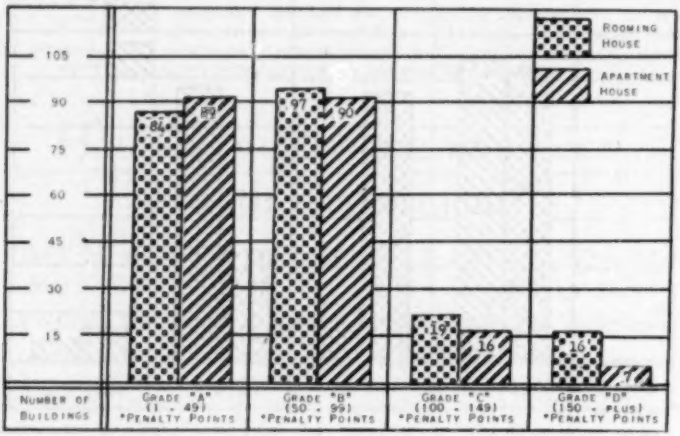
relating to health, safety, and sanitation of dwellings within the city. Laws may serve as a basic background and a legal means of securing adequate housing, but health education will probably correct more housing deficiencies through voluntary means than the exercise of legal authority.

RELATIONSHIP TO PUBLIC HEALTH

Adequate housing indirectly aids in the control of communicable diseases, but since San Jose has been intensively interested in the prevention of injuries in the home and is conducting a current study on the subject, it appears that the prevention of home injuries and home accidents is of more significance than communicable disease control. Overcrowding, defects in ventilation, poor lighting, and dangerous heating facilities, as well as inadequate repair, are a few of the items which contribute to both of these major problems. Lack of a solution for some of these problems has continued because of a lack of coordination of city services. Permits from building, electrical, or plumbing inspectors have not been secured in order to make adequate repairs. Lack of fire-resistant walls, coverings over stairways, deficient fire exits, windows that cannot be opened, and lack of fire extinguishers are all substandard indications and provide opportunity for injury or death in the event of a fire. Adequate fire inspection of the premises might prevent some of these defects.

A common discrepancy associated with overcrowding is the failure to provide janitorial services or adequate garbage disposal, thereby providing an opportunity for disease vectors to breed. Another health hazard is due to the fact that many apartments are simply rearrangements of existing rooms to include a kitchen area. Such rearrangements are usually associated with improper installation of facilities and, most commonly, in the lack of proper

CHART 2—Number of Penalty Points * Assessed to 216 Rooming Houses and 202 Apartment Houses



Grade A—which has 50 penalty points or less, indicates new construction, or good housing with only minor changes necessary.

Grade B—which has a range of 50–100 penalty points scored against the structure, indicates housing that is run down to a slight degree, but can be improved to Grade A with minor expenditures.

Grade C—which has a range of 100–150 points, indicates housing that has become so bad that rehabilitation is very difficult and may not be economically feasible because of the many major repairs and changes necessary.

Grade D—which has 150 or more penalty points scored against the structure, indicates housing of extreme low quality and is to be considered for condemnation.

* Penalty points are numerical figures assessed to any basic deficiency in direct proportion to the seriousness of the deficiency against health, safety, and livability.

doors separating cooking and sleeping areas. In many cases clothes closets are converted into "cubby hole" kitchens.

SOLUTION

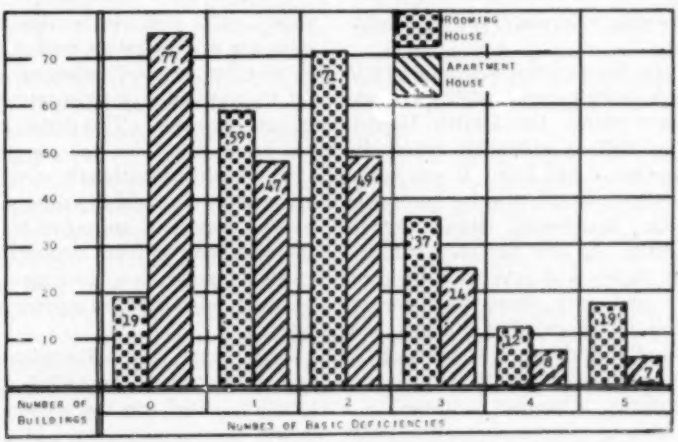
Elimination of duplication in inspection was an obvious answer to one of our problems. Efforts were made, which were successful, to secure the cooperation of other city departments in the problem of housing inspection; but to find one person, who had adequate training and experience in all of the skills and disciplines required for housing inspection, seemed to be an impossibility. It was also impossible for any one city department to assume responsibility for the enforcement of all of the laws emanating from the Police Department, Fire Department, Zoning Board, and the Public Health Department. By mutual agreement, it was decided that the Health Department sanitarian should serve as the controller for all the inspection services. An applicant should file his application with him and it would be his responsibility to see that all other departments interested in this particular application would approve it. The application would be approved by the Building Department for zoning; by the Police Department for moral character of the applicant;

and by the Fire Prevention Bureau and the Health Department for adequate maintenance, occupancy, and facilities. If problems were found which necessitated plumbing inspection, electrical inspection, or enforcement of the Building Code, these divisions might then be called into action. The applicant, however, actually dealt with only one individual—the representative from the Health Department.

While administratively, this was a very satisfactory arrangement, one of the major problems was the securing of an objective means of evaluating the usage of housing. After securing the assistance and consultation of the State Department of Health and the Public Health Service, we were able to make some progress. We owe a great debt of gratitude to Karl Zander and Ross Buck of the Public Health Service, as well as to Donald Suggs, formerly with the California State Department of Public Health, for their assistance and encouragement.

During the fall of 1950 the State Health Department arranged for a four-week "Seminar on Hygiene of Housing," conducted by representatives of the Public Health Service. One of the authors of this paper, Mr. Myers, was assigned to attend this course. Through the valued experience he had in this inservice training, and his enthusiastic acceptance of it, we were able to adapt to the needs of San Jose the American Public Health Association's *Appraisal Methods for Measuring the Quality of Housing* with relatively minor modifications. Our need was for regulation of housing rather than for condemnation for removal or highway clearance. While some modifications of the form were made, it became obvious in our use of it that there was a need for simplification of the San Jose Municipal Code in those sections regulating

CHART 3—Number of Basic Deficiencies in 216 Rooming Houses and 202 Apartment Houses

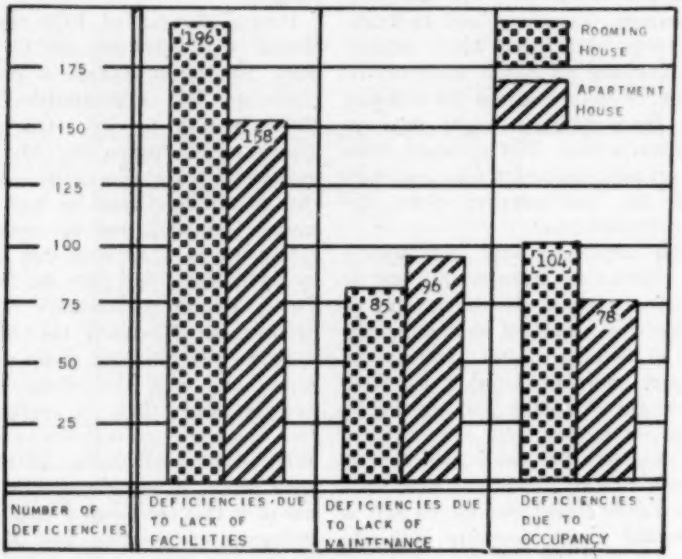


The great number of apartment houses having no basic deficiencies is due to the large number of apartment houses erected in the past three or four years.

The majority of the apartment houses and rooming houses are in the second and third column, which shows some basic deficiency present. These buildings are older structures or converted structures.

Rooming houses and apartment houses showing five or more basic deficiencies are condemnable. These buildings have been condemned, or are in the process of condemnation.

CHART 4—Classification of Deficiencies in 202 Apartment Houses and 216 Rooming Houses



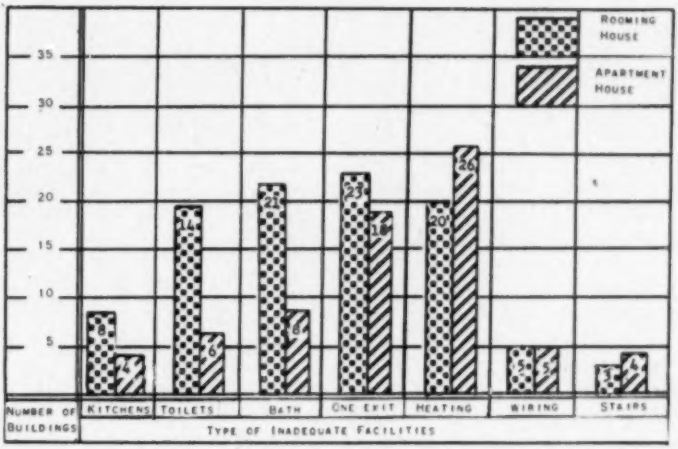
The three categories under which housing deficiencies fall are: lack of facilities, lack of maintenance and improper occupancy. Either lack of maintenance or overcrowding can cause facility deficiencies.

maintenance, occupancy, and condemnation.

We also found that it was necessary to establish definite responsibility for enforcement within the Health Department, as well as within the other city departments of San Jose. It was necessary to create a close working agreement with the Apartment House Owners Association. It also has been valuable to work closely with realtors in the community and with those who are responsible for appraisal of property. An opinion of the appraisers concerning the service which the Health Department has rendered to them is contained in a letter from one of the appraisers, Percy H. Thompson, "Many of the older homes are rapidly becoming victims of depreciation and obsolescence as well as bordering on health and safety violations. It is difficult for the average appraiser or real estate broker to keep up with the required adjustments without the assistance of a department such as you represent. This letter is to let you know that I for one see the value of the health department service." It has also been possible to coordinate our housing inspection and use of the APHA appraisal form with our home injury and accident prevention program, which began in July, 1951, on a demonstration basis.

One of the first administrative improvements which the APHA appraisal technics caused was the revision of our permit of occupancy form. The "permit of occupancy" is required by local ordinances and State Health and Safety Codes. It has been revised to include such information as zoning, land use,

CHART 5—Number and Type of Inadequate Facilities in 216 Rooming Houses and 202 Apartment Houses



The greatest inadequacy in rooming houses is lack of proper exits or means of escape from the second floor. Lack of bath and toilet facilities are due mainly to overcrowded conditions found in many rooming houses.

In apartment houses, the greatest deficiency is lack of proper heating facilities. Lack of proper exits is also a major inadequacy.

number of occupants, number of facilities, sex of tenants, and remarks pertinent to the structure. The permit which is now issued is actually a notification to the owner or lessee of exact conditions under which the structure can be legally rented. It prohibits much of the overcrowding of sleeping rooms, inadequate community kitchens, over use of existing facilities, and similar violations. While this document is a legal form it also performs a health education function.

Past efforts to make adjustments in housing have clearly revealed at least two major obstacles. One, there has been no tool or measuring stick by which valid comparisons could be made between individual structures, or between neighborhoods, or districts. Second, an obstacle has appeared in the burden placed upon the local enforcement officer to interpret the State Housing Act. Interpretations are demanded daily on infinite degrees of departure from the Codes. Evaluation of these variations presents a serious problem to the local enforcement officer. He is constantly fearful lest his interpretations may not coincide with those of his predecessor, or worse, that his determinations may be erroneous or subject to future controversy.

Alleviation of both of these obstacles is possible, to a large extent, by using the Appraisal Method recommended by the APHA. This provides a yardstick by which controversial items in the State Housing Act can be evaluated and working policies developed. The use of "penalty points" enables comparative ratings to be calculated for each structure inspected. "Penalty points" are assigned in direct proportion to the seriousness of the offense against health, safety, and livability. These two features, policy development and penalty points, have proved so worthwhile in San Jose that it is now possible to recog-

nize a clear avenue of approach to appraisal of housing hygiene.

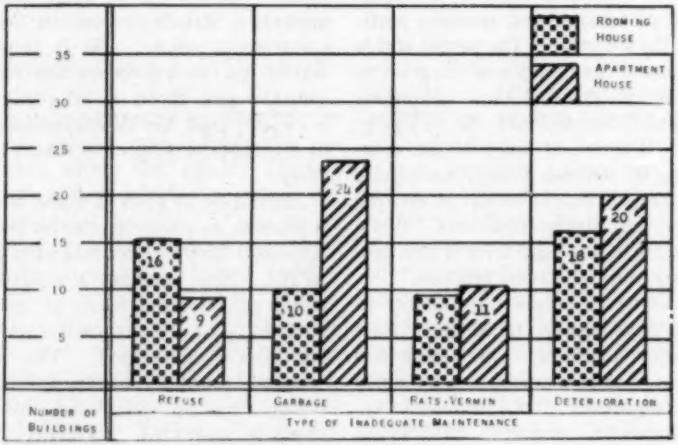
EXPERIENCE FOR TWO YEARS

It is now possible, after two years of using the appraisal technics, to report our experiences. Four hundred eighteen structures have been appraised. These structures contained almost 4,000 rental units. Collectively, these units accommodate nearly 9,000 persons out of our total population of 102,000. Of the 418 structures, 216 are rooming houses and 202 are apartment houses. A review of the charts indicates 322 dwellings with one or more basic deficiencies, structural or sanitary, or both. In nearly every case, adjustments were achieved, either by alteration or renovation. In 23 cases, the deficiencies were so excessive as to require demolition. What have these principal deficiencies been? As far as our experience is concerned, during these two years, they are:

1. Lack of proper bath and toilet facilities
2. Lack of proper ventilation of sleeping and living quarters
3. Overcrowding of sleeping quarters
4. Defects in plumbing
5. Rodent and vermin infestation
6. Lack of proper lighting due to absence of, or inadequacy of fixtures
7. Dangerous practices in handling food, both in individual rooms and community kitchens
8. Lack of proper janitorial services
9. Hazardous heating and cooking appliances
10. Lack of proper fire escapes and fire control equipment
11. Lack of proper refuse disposal and garbage disposal
12. Basement occupancy

The American Public Health Association's comprehensive method of housing appraisal technics has enabled

CHART 6—Type of Inadequate Maintenance of 202 Apartment Houses and 216 Rooming Houses



Garbage disposal is the greatest problem in apartment houses. This does not include the new apartments, but rather those which have been under operation for some time and have permitted the cans to deteriorate, or have failed to provide proper storage facilities for the cans. The newer apartments have proper space for the cans, and are usually supplied with a sufficient number of cans.

Refuse accumulation in the rooming houses is due mainly to the overcrowded conditions. By correcting the overcrowded conditions this accumulation of refuse problem is being lessened considerably.

Deterioration of the older buildings in both the apartment houses and rooming houses is about the same. Efforts are being made to lower the incidents of deterioration.

us to approach these problems with confidence that correction will be achieved. We have been able to perform our inspections on a comparable basis, since the technics are systematized to such a point that comparisons can be made between any two dwellings or any number of dwellings. The technics actually permit the establishment of numerical ratings.

From a public health point of view the above deficiencies are intolerable. They are inconsistent with reduction of communicable diseases; they present a frightful threat of injuries and fatality; they contribute daily to the occurrence of many home accidents. Furthermore, there are indications that many other aspects of community and social welfare are jeopardized by these deficiencies; as, for example, juvenile delinquency, broken homes, and mental disturbances. The eight charts which appear in this paper show our findings in 216 rooming and 202 apartment houses.

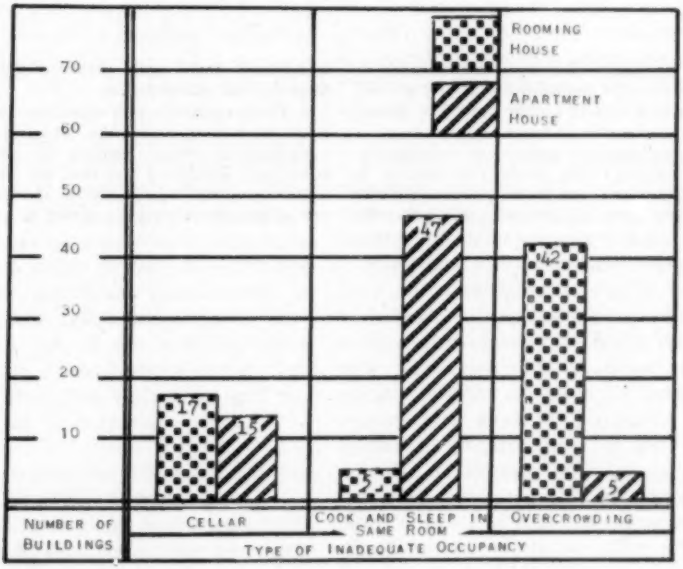
CONCLUSIONS

1. We now have a basic tool for the study, analysis, and solution of our housing problem in the use of the APHA *Appraisal Method for Measuring the Quality of Housing.*

2. Sanitarians or those who are to be responsible for housing inspection must be thoroughly and adequately trained in the use of this tool.

3. An analysis must be made locally to de-

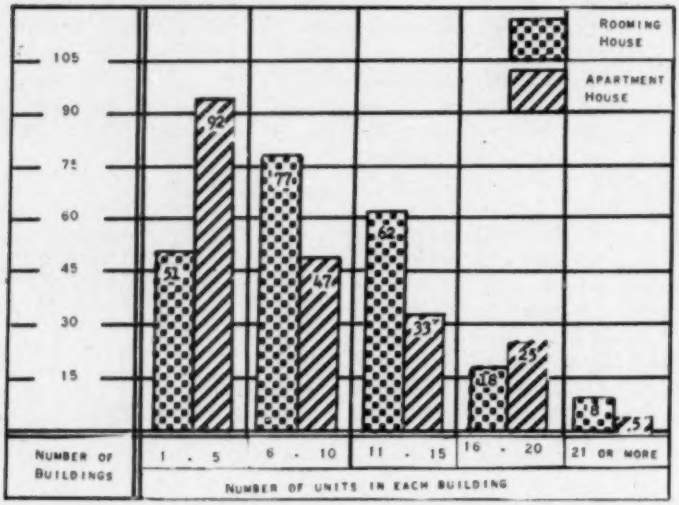
CHART 7—Type of Deficiencies Due to Occupancy in 202 Apartment Houses and 216 Rooming Houses



The greatest problem in apartment houses is cooking and sleeping in the same room. Many of the older remodeled buildings have illegally converted closets into kitchens.

The greatest problem in rooming houses is overcrowding of the sleeping rooms. Overcrowding of sleeping rooms is a major problem in the college area of the city, where large homes have been rented to students without regard to the adequacy of the available facilities.

CHART 8—Number of Units in 216 Rooming Houses and 202 Apartment Houses



NOTE: The greater number of rooming houses is in the six to ten unit class. This is due mainly to the use of large private homes converted into college rooming housing.

termine the basic objectives and demands in housing, both for the enforcement of state and local laws, as well as for the control of disease and the prevention of home accidents.

4. There must be community coordination of all interests, both public and private, in housing problems, and if the appraisal technics are to be used, all persons concerned must understand them and recognize their use, meaning, and interpretation.

5. Private agencies will appreciate their use more when they realize that unnecessary expenditures by official agencies for inspection have been eliminated and that the items involved have real significance for the health of the people whom we are expected to serve.

America is not alone in its effort to place public health education on a soundly productive basis. Reported here are the activities many European health agencies have under way.

International Developments in Health Education of the Public*

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IN making this presentation on international developments in health education, I am drawing from the experience of the European region with which the World Health Organization has been in intimate contact. Although the activities from only this one region are described, they reflect a cross-section of developments in countries in other regions of the world.

I am deeply impressed with the vitality, the number, and the soundness of the programs as they are evolving in many places. In country after country there is much interest in health education and a keen desire to strengthen programs so as to meet more adequately the health needs of the people. From the many significant developments in international health education, I have selected a few of the activities which consultants have observed during field visits. These activities are grouped under four major headings.

HEALTH EDUCATION DEVELOPMENTS ON A COMMUNITY-WIDE BASIS

Of all the work in health education, the most fundamental is that done with families, with school children, and with local groups in the community. The essence of health education lies in work with people, in assisting them to solve their health problems in accord with their particular cultural backgrounds and patterns of living. Through this day-by-day work in health education, people grow in their concept and knowledge of health matters and make changes in their attitudes and practices relating to personal, family, and community health.

In Italy, under the leadership of a provincial medical officer, a province-wide program involving many persons has been under way for some time. The program has necessitated the establishment of committees to study health problems and to work on local health improvements. During a "Health Week," over 60 communities participated in special health activities. Inservice training was given to physicians and teachers to prepare them for their role in this community work. A 20-day course on hygiene and health was arranged for teachers in elementary schools in the afternoon after school. Teachers from all over the province attended the course.

In several local health departments in Germany, medical officers have provided

* Presented in part at a Symposium on "Review of Health Education Activities around the World," at the Second Meeting of the International Union for Health Education of the Public, Paris, France, May 29, 1953.

leadership for a variety of educational projects, including the teaching of adult groups in maternal and child welfare, rat control, prevention of ascaris infestation, and other health problems. Slides and other inexpensive materials have been prepared locally to assist in the program.

Local programs in health education are being developed in Norway under the leadership of medical officers and public health nurses. These projects are based on health problems and needs as found in home, school, and community, as well as on the everyday interests of the people.

JOINT PLANNING BETWEEN AGENCIES AND ORGANIZATIONS

Although in some countries there are several, even many, agencies and organizations engaged in health education, on the whole there are far too few to give adequate attention to education on health problems.

Therefore, in some countries, in order to strengthen the total program, representatives from official and voluntary agencies meet informally as a committee or occasionally more formally as a council.

In Finland representatives of the national voluntary agencies engaged in health education and leaders in public health meet informally from time to time to exchange ideas relating to programs, problems, materials, and unmet needs. This national group has encouraged local workers to experience a similar exchange of ideas on a community basis. Following an international conference on health education, the committee discussed the values that might come from a national conference on health education and is initiating steps to organize such a conference.

In Greece a similar group of persons, through the leadership of the Health Education Service in the Ministry of Public Health and Social Welfare, meets periodically to learn about the health education activities of various agencies and organizations. These meetings provide an opportunity to see the gaps in program, to review overlapping activities, to encourage working together, and otherwise to strengthen the over-all health education program.

Groups such as these can stimulate analyses of program objectives, help to adjust activities in terms of important problems, and find ways to make better utilization of resources.

Closer working relations between official and voluntary agencies are being encouraged in Sweden through a National Society for Community Health. This society, long in existence, has been revitalized in order to bring about greater coordination of effort in health education. Coordinating groups on health education also exist in some local communities.

The voluntary agencies in Austria work closely with other agencies, particularly the schools, on specific and important health problems. Nutrition, tuberculosis, and school sanitation are among the problems receiving special attention in the educational projects. Materials have been prepared on these subjects for teachers and children and are distributed through the schools.

Realizing how important it is for education and public health authorities to work together, Spain designated as its two delegates to the European Conference on Health Education of the Public one from the National Health Administration and the other from the Ministry of Education. Moreover, representatives from education and public health are working together on programs relating to health education in schools.

In France, a group of volunteer women, working with the National Committee for Health Education, gives active support to health education. In helping with arrangements for the second meet-

ing of the International Union for Health Education of the Public this group worked in partnership with professional personnel.

Volunteer workers can contribute richly to the health program of a community. Through their knowledge of the community and through its leaders, they assist in bringing health services and the people together. As members of a board of directors of a private health organization, they can help to bring activities relating to public health to the community. As citizens, they can help to solve many health needs and problems existing in the community.

EVERY HEALTH WORKER A HEALTH EDUCATOR

Health education is not the role of any one professional group alone, but of many. Every health worker has important contributions to make to the educational program through individual or personalized teaching or through working with groups.

To help professional workers with health education responsibilities, the Central Council for Health Education in England sponsors a number of activities throughout the year, including summer courses. In the summer courses, medical officers, welfare officers, university professors, school teachers, health education officers, nurses, health visitors, sanitary inspectors, social workers, etc., study together. Through discussion of mutual problems and the exchange of ideas, professional workers from public health, education, medicine, welfare, and industry learn to appreciate the meaning of "teamwork" in health education and develop ways whereby each contributes to the total program of health education.

Another important activity for encouraging educational efforts on the part of health workers of different disciplines is the staff conference. There is a growing interest in the development of the educational aspects of the staff conference. In the WHO Regional Office for Europe, for example, regular meetings are scheduled in which the staff, sitting around a table, discuss program activities as well as problems incidental to the plan.

Out of this experience of thinking together, staff members develop common objectives and see ways of approaching common problems. For instance, the sanitary engineer and the health educator work with representatives of a community on an educational project in which environmental problems receive first and major emphasis; several staff members contribute to the development of teaching material on health education for midwives; or an interest is expressed in utilizing the findings from the field of adult education in planning for an intercountry conference.

PREPARATION FOR RESPONSIBILITIES IN HEALTH EDUCATION

No activity is more significant and more far reaching than that which prepares public health workers, teachers, and others for their responsibilities in health education.

Opportunities for preservice education of professional personnel are now being carefully scrutinized. At the same time notable progress is being made in sponsoring health education training programs for the workers already employed which will supplement their previous education and experience. In these training programs, efforts are being made to arrange "learning situations" through which the participants can gain insights as to functions and philosophy of health education, as well as to learn new technics and methods.

The following illustrations are examples of efforts to prepare public health personnel for their role in health education.

School of Public Health—To prepare persons engaged in public health work for their responsibilities in health

education, the School of Public Health in Turkey opened its first refresher course or institute for medical officers and sanitary aids in the summer of 1953. There was a professor of health education (visiting) on the faculty, as well as professors of environmental sanitation, epidemiology, vital statistics, maternal and child health, etc. The public health workers enrolled in the course had the opportunity to learn methods and technics of health education and to think through ways in which they could contribute to the educational program in their day-to-day work with people.

Fellowships—Governments and voluntary agencies are aware that health education can be extended and strengthened by encouraging persons in positions of leadership to obtain advanced training. A limited number of fellowships are available through WHO and other sources for advanced study in health education.

While the Health Education Service was being established in the Ministry of Public Health and Social Welfare of Greece, a well qualified person obtained a fellowship for a year's postgraduate study in public health education in an accredited school of public health. Upon completion of his study, this person was appointed to the position of director of the health education service.

In Yugoslavia, three fellowships were obtained by officers responsible for programs of health education of the public in their country. These fellowships provided the opportunity to study the administration and organization of national and local health education programs in other countries.

National Conference on Health Education of the Public—The Netherlands sponsored a two-week health education conference, under the leadership of the Institute of Preventive Medicine, leading voluntary agencies in the country, and the government. WHO provided consultants to assist in planning and carrying out the conference. About 45 persons from various disciplines—medical officers, administrators, nurses, social workers, educators, pediatricians, etc., participated. Discussions were based on the problems submitted by the participants. Throughout the conference the participants had the opportunity to observe and to utilize various technics of adult education, methods of health education, the use of visual aids, and other skills in their study of health education.

Leadership Training—In Germany, near Wiesbaden, a center for leadership training provides help in adult education technics for personnel workers in industry, youth workers, social workers, and nurses. Health workers appreciate more and more fully the contributions that come from other allied fields, such as adult education and psychology.

International Conferences — The WHO European Conference on Health Education of the Public, held in London in April, 1953, provided for exchange of ideas and experiences relating to health education. Representatives from 18 European countries participated in this conference, which was considered as but one event in a series relating to the development of health education. The scope of health education, its future growth, the health workers' responsibilities for health education, planning for health education, locally and nationally, methods and technics were among the subjects discussed. Fresh and new ideas gave vitality to a growing movement. Guidelines for the future growth of health education of the public were set forth. In the discussions special emphasis was placed on: local participation of the people in all steps of the health education program; teamwork with professional associates at all levels in order to strengthen the educational components of the public health program and the school health program; and health education as an aspect of all

education, as a part of a lifelong process, since in each stage of life there are special interests and needs.

A complete report of the conference will be made available to participants, their countries, and others. This and similar conferences are laying sound foundations for future developments in this field.

SUMMARY

Observations of health education on an international basis indicate that important and significant activities are being developed. These activities include health education on a community-wide basis; joint planning between agencies and organizations; development of the teamwork concept so that every worker makes his contribution to the educational component of public health; and preparation of personnel for health education responsibilities.

The Journal 25 Years Ago

The distance that we have come in the control of diphtheria in 25 years is illustrated by "Geographic Distribution of Deaths from Diphtheria" in the December, 1928, *Journal* (18, 12:1489). For 1926 and 1927 there were, respectively, 477 and 717 diphtheria deaths in New York City. In 1951 and in 1952 there was but one death from this cause among the 8,000,000 inhabitants of the city. In 1950, fewer than 6,000 diphtheria cases were reported in the entire United States, but in 1927 Illinois alone reported more than 6,000 cases. The quarter of a century has proved the accuracy of the 1928 diagnosis that "What is needed in the campaign for diphtheria prevention is intensive and effective effort to immunize a large percentage of the childhood population."

Herein is described a good medium for growing pertussis cultures for vaccine; one easy to prepare and inexpensive.

Beef-Heart Charcoal Agar for the Preparation of Pertussis Vaccines

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THE utilization of charcoal as a substitute for blood or serum was reported by Glass and Kennett (1939) [1] who found that *Neisseria gonorrheae* and *Neisseria intracellularis* grew freely on nutrient agar containing charcoal. Pollock (1947) [2] obtained a good growth of a strain of *Hemophilus pertussis* on charcoal agar, but this strain also grew freely on 10 per cent blood agar and on blood-free starch agar and was apparently not in phase I. More recently, Powell, Culbertson, and Esminger (1951) [3] reported that they had obtained good growth of *H. pertussis* phase I on charcoal agar which was incorporated in the Cohen-Wheeler [4] synthetic broth, and that pertussis vaccines prepared on this medium were, in most instances, as potent as the National Institutes of Health reference vaccine.

We were able to obtain some of the charcoal agar through the courtesy of Dr. Powell who also sent us a generous supply of the charcoal which was used in their medium. We prepared charcoal agar according to the Powell, *et al.*, formula and tested this together with the charcoal agar sent to us by Dr. Powell. Cultures of *H. pertussis* phase I grew equally well on both lots of the charcoal agar. The growth was smooth, the organisms were morphologically typical, and agglutinated well with anti-pertussis phase I serum.

The incorporation of charcoal agar in synthetic broth seemed to have a distinct advantage over synthetic broth as such. In our experience the growth of *H. pertussis* phase I in the different preparations of synthetic broth [4-9] was not uniformly satisfactory. Some of the strains of *H. pertussis* phase I failed to grow in the liquid media, and the concentration of organisms of the strains that did grow frequently varied within wide limits—not only in the different preparations of the synthetic broth but also in different bottles of the same preparations. We, therefore, continued to manufacture our pertussis vaccines on the Bordet-Gengou medium which has given uniformly good results over a long period of years. The medium of Powell, Culbertson, and Esminger gave such promising results that it seemed desirable to investigate it further as a substitute for the Bordet-Gengou medium. It occurred to us, however, that a simpler base than the synthetic broth used in the Powell, *et al.*, medium might give equally good results. With this object in view we carried out the following studies.

We used in our preliminary tests glycerine-potato extract agar, which is the base of the Bordet-Gengou medium, and beef-heart infusion agar to each of which 0.4 per cent of charcoal was added. These two media were tested with a number of strains of *H. pertussis* phase I.

The growth on the glycerine-potato charcoal agar was unsatisfactory. A number of the strains failed to grow, and those that did grow on the first generation failed to grow on subsequent transplants. The growth on the beef-heart charcoal agar was more promising. Although some of the strains failed to grow on this medium, also, a fairly good growth was obtained with some of the other strains. We continued our tests of the beef-heart charcoal agar using additional enrichments such as soluble starch, yeast extract, arabinose, and casamino acid. These reagents were used singly, as well as in various combinations.

After considerable experimentation we found that beef-heart charcoal agar that contained 1 per cent soluble starch and 0.35 per cent yeast extract gave excellent growth of *H. pertussis* phase I. This medium was prepared as follows:

Beef-Heart Charcoal Agar

Bacto-peptone (Difco)	10	gm.
Sodium chloride	5	"
Soluble starch (Merck)	10	"
Yeast extract (Difco)	3½	"
Agar agar	35	"
Beef-heart infusion	1,000	ml.*

* 500 grams beef-heart in 1,000 ml. H_2O

The reagents were dissolved over an open flame and the reaction adjusted to pH 7.4–7.6. Then, 4.0 grams of charcoal (Norit SG) were added, mixed well, and distributed into tubes or bottles. It was sterilized at 15 pounds pressure for one-half to one hour according to the size of the containers. The reaction after sterilization was usually pH 7.2–7.4.

This medium was tested with a number of strains of *H. pertussis* phase I. All but three of the strains tested grew more abundantly on the charcoal agar than on the control Bordet-Gengou medium. The three strains that did not grow abundantly on the charcoal agar also grew delicately on the Bordet-Gengou medium.

Some of the strains of *H. pertussis* were carried through 11 generations on the charcoal medium by transplanting them at 48-hour intervals. At each transplant the growth was examined by smear and was tested for agglutination with antipertussis phase I serum. The organisms remained morphologically typical and stained well by the Gram method throughout this experiment. They agglutinated to titer with antipertussis phase I serum through the ninth generation. After that some of the strains agglutinated poorly, thus indicating a change in phase.

The results obtained in these tests showed that *H. pertussis* phase I grew as freely and abundantly on the beef-heart charcoal agar as on the synthetic-broth charcoal agar of Powell, *et al.*

Our next problem was to determine whether potent pertussis vaccines could be prepared on this medium.

PREPARATION OF PERTUSSIS VACCINES ON BEEF-HEART CHARCOAL AGAR

Although no change of phase could be detected during a number of transplants of *H. pertussis* phase I on the beef-heart charcoal agar, it seemed advisable to carry the vaccine strains on 30 per cent sheep-blood Bordet-Gengou medium on which, in our experience, *H. pertussis* can be maintained in phase I for many months. Preliminary cultures for the vaccine were made by inoculating beef-heart charcoal agar in 1-inch tubes with the 48-hour growth on Bordet-Gengou medium. These were incubated at 35° C. for 48 hours. The growth on the tubes was suspended in 10–12 ml. of 1 per cent casamino acid of pH 7.2–7.4, and about 4 ml. of the suspension was inoculated on the charcoal agar in 1-liter bottles. The bottles were incubated for 24 hours at 35° C. They were then tilted back and forth to redistribute the growth over the entire surface of the

medium and were reincubated for another 24 hours. The 48-hour growth on the bottles was suspended in sterile physiological saline which contained 1–5,000 merthiolate. The growth was profuse, smooth, nonadherent and emulsified readily. Before pooling the growth, each bottle was examined by smear for purity and typical morphology. The saline suspension was then distributed aseptically into sterile bottles. Each of the bottles of the pooled growth was again tested for purity by inoculating a small amount of the vaccine on tubes of Bordet-Gengou medium, on blood-free agar, and into glucose broth in fermentation tubes in order to detect aerobic and anaerobic contaminants. These tubes were incubated at 35° C. for seven days. Growth of *H. pertussis* usually appeared within two to three days on the Bordet-Gengou medium and was typical culturally and morphologically. There was no growth on the blood-free media even after seven days incubation unless there was contamination. Bottles of the contaminated vaccine were discarded.

As soon as the tests for purity were made, the vaccine was incubated at 35° C. overnight in order to hasten the sterilizing effect of the merthiolate, and was then stored at 8° to 10° C.

The vaccines prepared on the charcoal agar usually contained a small amount of charcoal which was washed off with the bacteria from the medium. The charcoal was readily removed by filtration through sterile 40-mesh gauge of monel metal to remove clumps and through 200-mesh sterile nylon. Should a trace of charcoal remain after filtration, it can be removed by allowing the vaccine to sediment for several days in the ice chest and siphoning off the vaccine without disturbing the sediment. Using this method, only a negligible amount of the vaccine is lost through filtration and sedimentation, as the bacteria do not readily settle out on short storage.

After the purity tests were completed and the vaccines were filtered to remove the charcoal, they were standardized by means of a photoelectric cell to determine the concentration of the bacteria per ml. and were tested for sterility in the same manner as described for purity. In most instances the vaccines were sterile after several weeks storage.

A number of pertussis vaccines have been prepared on the beef-heart charcoal agar in the past four years. In each instance the growth was profuse and smooth, the organisms were morphologically typical, and the saline suspensions were homogeneous. Thirty-seven of the vaccines were tested for potency.

PRELIMINARY TESTS FOR POTENCY OF PERTUSSIS VACCINES PREPARED ON BEEF-HEART CHARCOAL AGAR

In testing the vaccines for potency it was expedient to combine some of the preparations in order to economize on mice, since large numbers of mice are required in each test. In the preliminary tests, three single vaccines and six combined preparations were used which represented a total of 16 vaccines. The tests were carried out according to the requirements of the National Institutes of Health. Several dilutions of each vaccine and of the National Institutes of Health reference vaccine were injected intraperitoneally into groups of susceptible mice of standard weights. A group of unvaccinated mice of the same lot and the same weights were set aside to serve as controls. Ten to 14 days after vaccination the immunized mice were challenged intracerebrally with 100,000 bacilli of a virulent culture of *H. pertussis* suspended in 1 per cent casamino acid solution of pH 7.2–7.4. The unvaccinated controls were divided into groups and injected intracerebrally with the challenge dose, and with smaller doses, in order to determine the virulence of the culture on the day of the test. Several of the small doses were

TABLE 1

Potency of Pertussis Vaccines Prepared on Beef-Heart Charcoal Agar

	Preliminary Tests		
Vaccine	*ED 50 × One Million*	*Reference Vaccine ED 50 × One Million*	*Remarks*
P149A	135		
P150	175	1,280	
P151	185		Vaccines P149A P150, and P151 are single vaccines, M25-M33 are combinations of 2–3 vaccines.
M25	450	1,160	
M26	1,070		
M24	375	1,000	
M31	670		
M32	400	1,600	
M33	240		

cultured on plates of Bordet-Gengou medium to determine the number of viable organisms in the given doses. The smallest number of the bacilli that killed 50 per cent of the control mice (LD_{50}) were used as the basis for calculating the virulence of the culture.

The vaccinated and control mice were observed for 14 days and the results are given in Table 1. No attempt was made in the preliminary tests to evaluate the results statistically. The ED_{50}, or the smallest amount of vaccine that protected 50 per cent of the mice for the period of observation, was estimated according to the Reed-Muench Method.[10]

The results obtained in the potency tests showed that eight of the nine preparations on the charcoal agar were considerably more potent than the reference vaccine, and the ninth was approximately as potent as the reference vaccine.

Tests for potency were then carried out on seven additional preparations of pertussis vaccines that were made on the charcoal agar and on six of the preparations that were tested in the preliminary studies (Table 1). These 13 preparations represent 34 individual vaccines. The results of these tests were evaluated statistically by the Wilson-Worcester [11] method and are charted in Table 2.

The results tabulated in Table 2 show that 12 of the 13 preparations tested were more potent than the reference vaccine and the thirteenth (M26) was approximately as potent as the reference vaccine. This last preparation is the same as that tested in the preliminary studies with the same result (Table 1 M26).

DISCUSSION

It was found that beef-heart agar containing 0.4 per cent charcoal, 1 per cent soluble starch, and 0.35 per cent yeast extract gave a very good growth of *H. pertussis* phase I. The organisms grew rapidly and profusely and the growth was very smooth, emulsified readily, and made a homogeneous suspension. The organisms were morphologically typical, stained well by the Gram method, and remained in phase I for a number of generations. The beef-heart charcoal agar proved to be an excellent medium for the preparation of pertussis vaccines. During the past four years a large number of pertussis vaccines were prepared on this medium and they were uniformly of high concentration. Thirty-seven of the vaccines were tested for potency; four of these were tested individually and 33 were combined into 12 preparations. All of these preparations, except one, were more potent than the reference vaccine, and that one was approximately as potent as the reference vaccine.

TABLE 2

Potency of Pertussis Vaccines Prepared on Beef-Heart Charcoal Agar

Vaccine		ED_{50} in Millions	Log ED_{50} ± 1 S.D.	Statistical Evaluation: ED_{50} Limits 1 S.D. in Per cent	Statistical Evaluation: $\alpha \pm 1$ S.D.	α 2 S.D. Limits	Challenge Culture LD_{50}: Bacilli	Challenge Culture LD_{50}: Limits 1 S.D. Per cent
Charcoal	M22	910	1.04 ± 0.16	69–143	1.14 ± 0.34			
"	M26	1,570	0.81 ± 0.34	221–450	0.54 ± 0.29		125	0
Ref. Lot	4/51	1,190	0.92 ± 0.11	77–130	1.92 ± 0.53	2.98–0.86		
Charcoal	M24	490	1.40 ± 0.16	77–129	1.94 ± 0.52			
"	M31	700	1.15 ± 0.19	65–155	1.00 ± 0.33		20	0
Ref. Lot	4/51	1,300	0.88 ± 0.17	68–147	1.11 ± 0.36	1.83–0.39		
Charcoal	M25	390	1.71 ± 0.13	75–134	1.47 ± 0.40		150	90–111
Ref. Lot	4/52	1,700	1.05 ± 0.31	49–206	0.62 ± 0.29	1.19–0.04		
Charcoal	M35	145	1.83 ± 0.22	60–165	0.96 ± 0.38			
"	P163	550	1.25 ± 0.12	75–133	1.57 ± 0.43		130	69–143
Ref. Lot	4/52	1,160	0.94 ± 0.11	77–129	1.87 ± 0.51	2.89–0.75		
Charcoal	M25	402	1.70 ± 0.18	66–151	0.93 ± 0.31		130	58–173
Ref. Lot	4/53	802	1.40 ± 0.09	81–123	2.59 ± 0.75	4.10–1.08		
Charcoal	M32	490	1.31 ± 0.17	68–147	1.00 ± 0.32		158	74–136
"	M33	145	1.83 ± 0.22	60–165	0.96 ± 0.38			
Ref. Lot	4/53	1,780	0.75 ± 0.11	77–129	1.98 ± 0.58	3.06–3.90		
Charcoal	M34	158	1.80 ± 0.18	66–151	0.97 ± 0.32			
"	M36	148	1.83 ± 0.16	70–144	1.16 ± 0.35		220	63–158
"	M37	148	1.83 ± 0.16	70–144	1.16 ± 0.35			
Ref. Lot	4/53	316	1.80 ± 0.24	57–174	0.70 ± 0.29	1.28–0.12		

The results that we obtained on the beef-heart charcoal agar correspond to those that were obtained by Powell, Culbertson, and Esminger on the synthetic-broth charcoal agar. The beef-heart charcoal agar, however, has the advantage of being a simpler medium than the synthetic-broth charcoal medium, since it requires fewer ingredients and, consequently, it is easier to prepare and is less expensive.

The beef-heart charcoal agar has several advantages over the Bordet-Gengou medium: (1) it eliminates the labor and expense of obtaining sterile blood which is required in the latter; (2) it reduces the loss of vaccine through contaminations which frequently occur when vaccines are prepared on a large scale on the Bordet-Gengou medium, because the blood must be added to this medium after sterilization, whereas the charcoal agar is completely sterilized before it is used; and (3) more concentrated vaccines are obtained on the charcoal agar than on the Bordet-Gengou medium, because the organisms grow more profusely on the charcoal agar than on the Bordet-Gengou medium.

Although our investigation showed that strains of *H. pertussis*, cultured on the beef-heart charcoal agar, remained in phase I for nine generations, it seemed advisable to maintain the cultures that were used in vaccine preparation on Bordet-Gengou medium in order to insure against any possibility of deterioration during the preparation for the vaccine. In our experience, cultures of *H. pertussis* phase I showed no change of phase after cultivation on the Bordet-Gengou medium for a number of months. By using the method of inoculating the preliminary cultures for the vaccines from the Bordet-Gengou medium to beef-heart charcoal agar, which in turn were inoculated on the charcoal agar in bottles, highly satisfactory results were obtained.

SUMMARY AND CONCLUSIONS

Beef-heart charcoal agar has been found to give a rapid and profuse growth of *Hemophilus pertussis* phase I. The growth was smooth, the organisms were typical morphologically, culturally, and serologically.

A number of pertussis vaccines were prepared on this medium, and the growth was uniformly highly satisfactory. It was smooth, nonadherent, emulsified well, and showed no tendency to clump on storage. To date, four individual vaccines and 12 combined preparations have been tested for potency. These 12 preparations represent 33 individual vaccines, giving a total of 37 vaccines tested. All except one of the vaccines were higher in potency than the National Institutes reference vaccines, and the one exception was approximately equal to that of the reference vaccine.

Although a comparatively small number of the vaccines prepared on the beef-heart charcoal agar were tested for potency, the results obtained in this study indicate that this medium is excellent for the preparation of pertussis vaccines. The medium is easy to prepare and is inexpensive, and for these reasons it promises to be the medium of choice for the preparation of pertussis vaccines.

ACKNOWLEDGMENT — Grateful acknowledgment is made to Mary F. Gonshorek, senior bacteriologist of the New York City Department of Health, for testing a number of the vaccines for potency during the illness of the senior author and evaluating the results statistically and also for improving the method of filtration in removing the charcoal from the vaccine.

Technical assistance in this investigation was given by Vincent Luongo, Maurice Gerstein, Christine Edwards, and Seymour Finger.

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Annually More School Children

"The remaining years of the present decade will witness a steady rise in our school age population, their number increasing by an average of more than 1,000,000 annually." Thus the August, 1953, *Statistical Bulletin* of the Metropolitan Life Insurance Company introduces its discussion of what the country may expect in school age population just ahead. By 1960 it estimates there will be a growth of more than one-fourth in number of children 5–17 years of age. Without any allowance for interstate migration, the increase between 1953 and 1960 will be more than a third in the West and more than one-fifth in the South. The percentage increase will be greater among those 14–17 years than among the younger group. The estimates for the older age group have been carried to 1964 by which time an increase of more than 60 per cent will have taken place and of more than three-fourths in the West.

The article concludes, "The problems of providing adequate school facilities and teaching staffs to meet the needs of the rapid growth of our school age population are already with us. These problems will be even larger in the years ahead, particularly at the secondary school level."

Vol. 43

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association, Inc.

Volume 43 November, 1953 Number 11

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A CATALYST AMONG GOVERNMENT HEALTH AGENCIES

A LEAFLET entitled "Meeting Your Hospital Personnel Shortage" is the latest publication of the Health Resources Advisory Committee, Office of Defense Mobilization. This report points out that the shortage of skilled hospital personnel will be with us for a long time; this shortage is the product of trends in medical care which we neither can nor wish to reverse. There are more nurses practicing their profession than ever before; a larger proportion of girls are entering nursing than ever before (except 1943–1945, as a result of efforts of the Nurse Cadet Corps), but because of the low birth rate in the depression years, the absolute number of girls who enter nursing school each year is now lower. There are not enough nurses to meet the hospital demand and there is no indication that there will be in the foreseeable future. One way to help meet this problem is by modernizing our methods of utilizing hospital personnel. The committee suggests several steps through which better utilization may be obtained.

This leaflet is the first of a series directed to hospitals. The committee promises further studies on the better utilization of health personnel in home care programs and in the public health and industrial health fields.

This valuable publication again brings into focus the unique services of an officially appointed advisory committee of eight competent people,* outside of government, working quietly, but effectively in the health field. Now entering its fourth year of voluntary service to the government, this is one of the few groups

* Members of the Health Resources Advisory Committee: Dr. Howard A. Rusk, professor and chairman of the Department of Physical Medicine and Rehabilitation, New York University, Bellevue Medical Center, New York, N. Y.; Dr. Harold S. Diehl, dean of the medical sciences, University of Minnesota, Minneapolis, Minn.; Ruth Sleeper, director of nursing, Massachusetts General Hospital, Boston, Mass.; Dr. Francis J. Braceland, psychiatrist-in-chief, Institute of Living, Hartford, Conn.; Dr. Leo J. Schoeny, member, Special Committee on National Emergency Dental Service, American Dental Association, New Orleans, La.; Dr. William P. Shepard, third vice-president, Metropolitan Life Insurance Company, San Francisco, Calif.; Dr. Edwin L. Crosby, director, Joint Commission of Accreditation of Hospitals, Chicago, Ill.; and Dr. Alan Gregg, vice-president, Rockefeller Foundation, New York, N. Y.

appointed by the previous administration which was carried over intact by the new administration, one heartening indication of the interest of the White House, at least, in the health of the nation.

The committee plays a double role. As a Health Resources Advisory Committee to the Office of Defense Mobilization, and thus to the White House, it studies and plans to meet the over-all needs of the nation in health personnel and materiel. Under its other title, the National Advisory Committee on Health Personnel to Selective Service, it finds out how many physicians, dentists, veterinarians, nurses, and other scarce health personnel are available for military service—who and where they are. This latter function is carried out through state and local advisory committees consisting of one physician as chairman, one dentist and, in all state committees, the state health officer. It would seem that a nurse should also be included in such a group.

Among the committee's accomplishments in these past three years are: the formation of an Inter-Agency Health Resources Council consisting of one or more representatives from each governmental agency concerned with health, meeting bimonthly to discuss problems of mutual interest, thus offering an opportunity for this entire group to get together on problems of mutual concern.

Soon after the outbreak of the Korean conflict, it was apparent that permanently disabled military personnel might well be transferred to Veterans Administration Hospitals to avoid unnecessary duplication of extremely expensive rehabilitation facilities and to insure better utilization of the limited supply of trained professional personnel. Already over 5,000 military personnel have been thus transferred.

One of the earliest and most significant accomplishments of the committee was an agreement with the Secretary of Defense to review periodically the projected acquirement of the Armed Services for physicians, dentists, veterinarians, and nurses; to examine each list of reserve officers in the categories involved, and to advise the secretary on their essentiality for civilian health services. At one time during World War II, the ratio of physicians to troop strength in the Armed Forces reached a high of about six physicians per 1,000 troops. The ratio of effective physicians in civil life was thereby reduced to the dangerously low level of considerably less than one per 1,000 civilians. Through repeated and prolonged discussions with the respective Surgeons General of the three Armed Forces, reduction in military medical personnel was mutually agreed upon, and the Secretary of Defense has recently issued an order which will bring down the ratio to three physicians per 1,000 troops. The present ratio is 3.7. It is estimated that this change has saved about 5,000 physicians for civilian health services who would otherwise have been in the military. It has saved the Department of Defense between 40 and 50 million dollars during the past two years.

In June, 1951, at the request of the Department of Defense and the American National Red Cross, a subcommittee was formed for the purpose of constructing and coordinating a National Blood Program. Following hearings, study, and recommendations by this subcommittee, there has evolved a National Blood Program which now serves the needs of the Department of Defense, the Federal Civil Defense Administration, and at the same time assures the normal needs of the civilian population. Later this subcommittee, acting on recommendations of the National Research Council, worked out the difficult problem of equitable distribution of an unavoidably short supply of gamma globulin for polio prophylaxis.

Recognizing that good health among workers is fundamental to increased indus-

trial production, the Health Resources Advisory Committee has given considerable attention to methods of improving industrial health services, especially among smaller industries. It has distributed over 30,000 pamphlets on industrial health services, assisted with revising the health aspects of the Walsh-Healy Defense Production Act, and has created a special task force on the handicapped.

The committee's special studies include an analysis of the teaching staffs of medical, dental, veterinary, and public health schools; state and local health department needs; inventories of intern and resident staffs; armed forces rejection rates for physicians and dentists; construction of rosters of physicians, dentists, and veterinarians and surveys of the current supply, potential future supply, and projected needs in both civil and military life.

On the committee's recommendation, the Director of the Office of Defense Mobilization requested the Public Health Service to become the claimant agency for all health equipment and supplies, medicinals and chemicals, biological preparations, blood and blood derivatives.

Although solely an advisory committee, its advice is regularly requested and acted upon by the Office of Defense Mobilization, the Department of Defense, the Selective Service System, the new Department of Health, Education and Welfare, and occasionally by members and committees of Congress. One might suggest that the House Appropriations Committee and the Bureau of the Budget would benefit from the informed and expert opinion of this group before learning by the hard way "the high cost of parsimony" when dealing with the health of the nation.

VISITING HOMEMAKER

THE extraordinarily high cost of hospitalization has been recognized in numerous efforts of various sorts to transfer to the home the care of illnesses that do not actually require the elaborate provisions of a modern hospital. The best known of such projects, and one of the most successful, has been the Montefiore Plan in New York City. Everywhere, of course, the presence of a well planned and well supervised public health nursing service plays an important role in home care.

In all such programs, and in many other types of domestic emergency, there is a fundamental need to provide—not only for the care of the patient—but for the performance of the nontechnical household tasks which a handicapped housekeeper is unable to perform.

In Denmark a comprehensive national program has been initiated to meet this need. During the first year of its operation, 23,000 families in Copenhagen alone have taken advantage of a law providing government subsidized household help during family emergencies at a cost scaled to the family's ability to pay. The household helpers, middle-aged women, are government-trained in the arts of housekeeping, cooking, repairing clothing, caring for children, and budgeting. Their stay with any one family is generally restricted to a fortnight.

Illness in the home accounted for more than half of the answered calls for help, and both hospitals and clinics have reported a declining demand for hospital treatment since the law has been in operation. In cases where it has been necessary for wives to enter hospitals, the household helper has been able to preserve the home for the husband and children, and the authorities consider this the most important result of the law.

In the sliding scale, a family of four in Copenhagen having an income of less

than $1,000 a year would receive such aid free of charge; the same-sized family with an income of $2,100 or more would be charged $2.75 a day.

A somewhat similar program was initiated by Sir Allen Daley in England as early as 1920. It formed a part of the program of the National Health Service Act of 1946. At the end of 1950, over 2,500 of these "Home Helpers" were employed by the London County Council, serving a total of 25,805 families. At the end of 1949, there were 3,967 full-time, and 14,688 part-time workers of this type employed in England and Wales.[1]

Less ambitious programs of a similar kind have been initiated under private auspices in many North American communities. One of the best examples is to be found in Toronto. The Visiting Homemakers Association of Toronto[2] is a constituent member of the Community Chest. It provides two distinct types of service: 46 homemakers are employed in short-term service during confinement or temporary illness; and 16 staff members are employed in long-term service, where such assistance may be feasible as an alternative to placing "deprived" children in foster homes. These homemakers render a service far more intensive than that of domestic help. Their work is so planned and supervised as to involve fundamental advice about adequate nutrition and sound family budgeting. Sometimes their work extends to doing educational training of a teen-age girl who may be keeping house. The association tries to give these workers a "sense of mission and a semi-professional status." Their work is supplemented by special classes for training mothers, themselves, in nutrition, budgeting, and household management.

The cost of the service is estimated at $7 per day, but only a few families can pay this maximum fee. In most instances, the amount that a family can pay is supplemented by the city or by the association itself. Actually, clients' fees pay only about 22 per cent of the total cost. The association derives the major portion of its own funds from the Community Chest.

The organization works in the closest cooperation with the health and social agencies of the community. It performs a most useful function through its services to the families involved; and by its continuing self-analysis and careful planning it is adding materially to our knowledge of the best ways in which the sciences pertaining to homemaking can be applied on a practical scale.

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1. Sir Allen Daley, M.D. The British Home Help Service. *Am. J. Nursing* 52:991–993 (Aug.), 1952.
2. The Visiting Homemakers Association, 511 Huron Street, Toronto 5, Ontario.

RENÉ SAND

THE death of René Sand on August 23 has taken from us one of the most outstanding world leaders in public health.

Sand was born in 1877 and made his first appearance in the international field in 1921 when he joined the staff of the League of Red Cross Societies, of which he became Secretary-general. In 1929 he founded and became the first president of The International Hospitals Association. He served as secretary-general of the Belgian Ministry of Health beginning with 1937. After the second World War he occupied the chair of social medicine at the University of Brussels (1945–1952). He took a prominent part in the activities of the health section of the League of Nations and the World Health Organization.

Sand's greatest influence was, however, exerted by two important books,

L'Economie Humaine par la Médecine Sociale (1934) and *Vers la Médecine Sociale* (1948). The second of these volumes * is one of the most notable contributions made in our time to the philosophy of public health. The term "social medicine" requires some explanation to the American reader. It includes in its view not only the work of the physician and nurse, but that of the engineer, the physiologist, psychologist, the health educator, and all the other specialists participating in the public health program. He says, "In relation to the isolated individual, the art of preventing and curing disease is known as private medicine. In relation to the community as a whole, it is public medicine. In relation to those people and classes whose conditions call for special measures, it is social medicine." The last two of these fields are commonly included in our definition of public health.

In an inspiring series of chapters, Dr. Sand reviews the history of the medical profession and the hospital, of personal hygiene and public health, of "social hygiene," of industrial medicine, of social assistance, of anthropology and psychology, and the history and the philosophy of "social medicine" in various countries.

Dr. Sand received in 1951 the highest honor which can come to a public health worker in the international field, the Léon Bernard Medal of the World Health Organization; but his best monument will remain for many years his notable book, *The Advance to Social Medicine.*

* Published in English as *The Advance to Social Medicine.* New York: Staples Press, 1952.

WELCOME TO A NEW COLLEAGUE

NURSING Outlook,* which has taken the place of the *Public Health Nursing* magazine during the present year, has got off to a head start; and we cordially welcome this new colleague in the field of public health journalism.

The "Outlook" of this new magazine is a broad one. It devotes much space to problems of planning and organization. For example, an article in the July, 1953, issue on "Changing Aspects of Public Health" by R. P. Kandle (a member of the APHA staff of whom we are proud) is particularly stimulating and important. The author acutely remarks that "our efforts seem to be in getting other people to change and in resisting the efforts of others to change us"; but he gives us good reasons why thoughtful and continuing adjustment is essential. On the other hand, we quote from his analysis, "We get glimpses of new horizons, and new tools with which to work that are fascinating and that challenge the best that is in us." He reminds us that "There are always at least two sides to change. They are the giving up or the adjusting of old services and the development of new ones." He urges the importance of daily evaluation by each staff member of the significance of the results attained.

Above all, however, it is upon the administrator that the responsibility of planning rests. Every health officer should give prayerful consideration to the problem of attaining for every dollar spent on health protection at least 10 dollars' worth of results.

We believe that in such planning *Nursing Outlook* will provide valuable hints. It is likely to have an appeal far wider than its impact on the public health nursing profession alone. It should be on the subscription list of every health department and should pass over the desk of the health officer himself.

* American Journal of Nursing Company, 2 Park Avenue, New York 16, N. Y.

Clearing House on Public Health Salary Information and Personnel Needs

THE SECOND MANPOWER SOURCE BOOK

The second in the Public Health Service's source books on health manpower has been published. On nursing personnel, this newest volume covers both professional and practical nursing as they are today and as they have been developing over the past 50 years. For the first time information is brought together in one place that has previously been available only from a variety of sources—the nurse, hospital, and medical associations, the U. S. Bureau of the Census, Office of Education, and several divisions of the Public Health Service.

A series of seven statistical tables are devoted to public health nursing, giving detailed data for 5-year intervals since 1937. Public health nurses represent between 6 and 7 per cent of active registered nurses. The increase in their number since 1937 has little more than kept pace with population increases. In 1937 there were 7,500 persons per public health nurse, today there are 7,000.

Section I of this source book, published in May, 1952 (Health Manpower Fully Documented. *A.J.P.H.* 43, 5:604), dealt with medical manpower. Others on personnel of the various health disciplines will follow at intervals in the future.

Health Manpower Source Book, Section 2; Nursing Personnel, PHS Publication No. 263, Section 2. Gov. Ptg. Office, Washington 25, D. C.; 40 cents.

FURTHER NFIP RESEARCH FELLOWSHIPS

In order to increase the number of professional workers qualified to give leadership in the solution of basic and clinical research problems, including those of poliomyelitis and other crippling diseases, the National Foundation for Infantile Paralysis has made available a limited number of additional postdoctoral fellowships to candidates interested in research and teaching in medicine and related sciences. Fellowships, covering from one to five years, carry stipends of from $3,600–$7,000, depending in part upon marital and dependency status. In addition, institutions that accept Fellows receive compensation for expenses incurred in the training program.

Candidates must be United States citizens (or with declared intent to be), in sound health, and have an M.D., Ph.D., or equivalent degree. Candidates are selected by a Fellowship Committee of leaders in medical research and professional education. Successful candidates will be given the title of "Fellow of the National Foundation for Infantile Paralysis."

Further information from Division of Professional Education, National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

PHYSICAL REHABILITATION TRAINING

A four-week advanced course in Physical Rehabilitation Methods is being offered for physical therapists by the Institute of Physical Medicine in conjunction with the New York University School of Education. "All aspects of orthopedic, medical, and surgical cases and their specific problems in rehabilitation are discussed," according to the announcement.

The course is open to "certified physical therapists who have the approval of the curriculum director." Tuition is $80, registration fee $8, and rooms for the four weeks from $55 to $75. The course will be given November 23–December 18, 1953; February 1–26, and May 2–29, 1954.

Applications and further information from Edith Buchwald, Institute of Physical Medicine and Rehabilitation, 325 E. 38th St., New York 16, N. Y.

GRADUATE FELLOWSHIPS FOR WOMEN

The American Association of University Women offers to American women 25 fellowships for the academic year 1954–1955, with stipends varying from $1,000 to $3,500. In general, the $2,000-fellowships are available for persons who have already completed course work for their Ph.D. or received the degree; the $2,500 to $3,500 fellowships are for more mature scholars who need a year of uninterrupted work for writing and research. Twenty fellowships are unrestricted as to field of interest; the others are for study in social work, for prospective teachers, for research in chemistry, physics or biology, and for research. Applications and supporting materials must reach the office in Washington by December 15, 1953. Further information from the Secretary, Committee on Fellowship Awards, American Association of University Women, 1634 Eye Street, N. W., Washington 6, D. C.

ADDITIONS—AND A CORRECTION

Readers—and particularly the author—have taken exception to the resumé, "Ten Years of Retirement Protection" in the August Clearing House. The objection—well taken—that a sentence pointing out the low coverage through state and local retirement systems, followed only by a sentence about the states with a relatively high coverage through a combination of both state and local retirement systems or old-age and survivors insurance or both, leaves an erroneous impression. Thus, South Dakota and Mississippi at the time of the study had only 2 and 3 per cent, respectively, of state and local employees covered by state or local systems, but had 66 and 79 per cent, respectively, covered by old-age and survivors insurance, the highest percentages in any of the 48 states. In other words total coverage is the important fact, not the system by which workers are covered.

In addition, some of the facts of the study were unfortunately garbled as well. The two sentences that need correction should correctly read:

> In nine states and the District of Columbia more than three-fourths of government employees are members of state or local retirement systems.
>
> Eight states, Georgia, Maine, Mississippi, New Hampshire, North Dakota, Utah, Vermont, and Wisconsin have more than a fourth of the workers in jobs covered neither by a state or local system nor by old-age and survivors insurance.

Editor's Note—We are sorry both for the errors and the possible wrong impression given by selecting one or two facts as suggestive material intended to lead readers to the full article. With the limitations of space, we can select only one or two items of an article for mention. Hence, we urge everyone concerned with personnel problems in health organizations to read the full report, "Retirement Protection for State and Local Employees: Ten Years of Growth," by Dorothy McCamman in the *Social Security Bulletin* of May, 1953. It details fully the qualifications, meaning, and interpretation of the statistical and other data. It is available from the Social Security Board or the Government Printing Office, Washington, D. C.

It might also be added that Mississippi reports that since Miss McCamman's analysis a state retirement act covering all state and local employees has gone into effect. This system provides social security coverage and a state retirement annuity plan.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

Textbook of Public Health—*By W. M. Frazer (13th ed.). Baltimore, Md.: Williams and Wilkins,* 1953. 663 pp. Price, $8.50.

Despite the handicap of the death of his colleague and long-time co-author of this fine volume, Dr. C. O. Stallybrass, the present author has ably continued the periodic revision of this work alone. Among other things, the recent major changes in British health service laws and organization must have made this a considerable task.

As a classic and long accepted standard text, this book requires little elaboration in review. The substance of the book covers all of the technical fields which are of concern in British public health practice and some few that remain for the explorations of future administrators, such as the sections on Meteorology and Genetics. The chronic diseases are dealt with as they appear in relation to other context rather than as a distinct subject area as we are inclined to handle them in this country.

To the extent that it is appropriate to do so, each area of public health concern is systematically, and in considerable detail, presented in three phases: the fundamental medical, engineering, or other technical facts concerned; a description of the organizational structure addressed to the needs in the area under discussion; and a brief review of the relevant regulations or legislation in effect.

This is a book of facts well presented and selected in the thoroughgoing and scholarly fashion that is possible only after much experience. It will serve as an extremely valuable source of fundamental information about public health in general and public health practice in Great Britain in particular.

EDWARD S. ROGERS

It's Not All in Your Mind—*By Dr. H. J. Berglund and H. L. Nichols, Jr. Greenwich, Conn.: North Castle Books,* 1953. 343 pp. Price, $3.95.

This book is divided into 17 chapters. The authors state their objectives clearly in the Introduction: "During the past twenty years, some psychiatrists and analysts have urged a new concept of healing which they call psychosomatic medicine. It is founded on a favorable response to psychiatric treatment of certain diseases in certain people, and on theories regarding the development of personality. . . . Their techniques are valuable in a limited field and contain promise of wider future application. However, their claims are far ahead of anything they have proved or accomplished, and they are causing serious harm to both the practice and the spirit of physical medicine. The damage arises chiefly from a perversion of their doctrines to serve as an excuse to ignore ailments which make up a substantial fraction of national suffering. . . . It is the purpose of this book to assemble in one place a simple explanation of the mechanisms of mind and body which are involved in personality and its effect on disease; the nature of psychoanalysis, and of psychosomatic theory and practice; and the undeniable physical basis of allergy, glandular difficulties, and back pain."

They keep their objectives in sight in logical sequence with chapters on Body,

Brain and Nerves; Reflexes and Suggestion; Components of Personality; Neuroses and Psychoses; Dreams; Psychoanalysis; Psychosomatic Medicine, etc. The descriptions are written in simple words that convey understanding.

In conclusion, the authors deal frankly with the weakness of the analytical technics as follows: "The chief weakness of psychoanalysis is probably lack of knowledge of basic, instinctive, human character. Its doctors do not know what our instincts are, what part of our basic drives is inborn, and what part acquired. They have no way of distinguishing between a conflict predetermined by internal contradictions and one which is the whole individual against his environment, or mixtures of the two."

The first part of this book contains so much honest and scientifically sound thinking that it seems a pity that in the last part the writers go overboard on allergies, the details of which become tedious and repetitious. A suggestible lay reader might become confused, anxious, and discouraged that an exhaustive study of his asthma, hives, dermatitis had not discovered *the* source of his trouble as to make his symptoms worse. ESTHER LORING RICHARDS

Analysis in Dental Research—*By Neal W. Chilton. Washington, D. C.: Office of Technical Services, U. S. Department of Commerce,* 1953. 218 pp. Price, $3.00. (Mimeo.)

Dental public health has suffered from the lack of a statistical textbook dealing adequately with dental data. Chilton has therefore not only satisfied the needs of dental students and dental practitioners but also has added significantly to public health literature by writing this volume.

Lucidly, he discusses Basic Concepts in Experimental Investigations, The Normal Curve, Concepts of Chance Variation, Normal Curve Analysis of the Four-Fold Table, Chi-Square, Correlation and Regression, Comparison of Averages of Small Samples, and Some Problems Pertinent to Public Health Dentistry.

Since the widespread interest in water fluoridation has catapulted dental research into a prominent position among public health investigations, this book should prove most useful to public health administrators. For example such terms as DMF rate, dental caries experience and the indexes derived from the DMF rate, as well as the def rate, are thoroughly explained.

As Kandle and other surveyors of public health programs have stressed, we need to do more evaluating of our efforts, particularly is this true of dental programs. Chilton's contribution will do much to stimulate routine appraisal of dental programs if it receives the attention it merits from public health workers. J. M. WISAN

Housing and Family Life—*By J. M. Macintosh., London: Cassell and Company, Ltd.,* 1952. 230 pp. Price, 16/–.

A short review cannot do justice to this discerning book written by a professor of public health at the University of London. The author asks why we persist in building "houses of yesterday for people of tomorrow." He answers that houses are still being built "with all their sins upon them" because of failure to apply adequate standards of health and comfort, and he believes that too little emphasis has been placed on the psychological effects of housing.

Professor Macintosh recognizes the difficulties in proving a correlation between family health and housing, per se. However, on the premise that the family unit is an important essential for complete health and that the house is the basis of family life, his own studies and judicious interpretation of other data support the hypothesis of a direct rela-

tionship. He assesses such controversial matters as central heating in Britain, prefabrication, subsidized housing, and minimum standards of sanitation in every dwelling, emphasizing that minimum standards imply a minimum for *each* standard—excess of one cannot compensate for deficiency in another.

Although the book is primarily concerned with British housing, anyone can profit from the appraisal of early unsound subsidy policies and slum-clearance practices which increased overcrowding, and many of the recommendations are applicable in any country. The author proposes using a system of rent reduction as an incentive for cleanliness and good household management to mitigate the creation of slums. His conviction, from an analysis of practical use of space, that the three-bedroom house is the most suitable size throughout the entire cycle of the ordinary family warrants further consideration. ELEANOR WATKINS

The Epidemiology of Health—*Edited by Iago Galdston. New York: Health Education Council,* 1953. 197 pp. Price, $4.00.

The dominant theme of this volume is the positive approach to more perfect health rather than mere prevention of disease. Editor Galdston aptly illustrates this approach by citing a recent British study. Using the simple criteria of height, weight, and physical development, this study of "healthy" boys demonstrated the existence of significant differences correlated with economic status and provided the basis for positive action to raise the less favored group.

Dr. John E. Gordon competently recounts the development of epidemiologic theory from its narrow beginnings to its present synonymity with medical ecology. The next step, he suggests, is a study of the ecology of health upon which sound measures for the promotion of health may be based. In later chapters Drs. Alton S. Pope and Herbert Pollock effectively employ tuberculosis and nutrition, respectively, to illustrate this thesis. General Armstrong presents military medicine as a convincing application of the epidemiology of health. In a chapter full of wisdom for the guidance of parents, Dr. Erich Lindemann identifies mental health with emotional maturity and provides some stimulating insight as to how this may be achieved.

Other topics touched on include historical concepts of health (Dr. Owsei Temkin), industrial medicine (Dr. Leo Price), old age (Dr. F. D. Zeman), pertinent changes in private medical practice and attitude of physicians (Dr. Roger I. Lee), the distinction between personal and public health (Dr. Haven Emerson), and behavior-centered health education (Dr. G. W. Larimore). An exceedingly entertaining contribution by Dr. Ralph Gerard should be read by medical educators since it suggests that medical students not only should but can be taught to think.

Although no textbook, the volume constitutes ideal ancillary reading for medical students. It definitely should be read by teachers of medicine and all those interested in public health. It might even be read with profit by practicing physicians. JOHN P. FOX

School Nursing in the Community Program—*By Marie Swanson, New York: MacMillan,* 1953. 543 pp. Price, $5.00.

An introductory statement by the author provides the frame of reference for the book. "In the half century of its existence school nursing has developed many patterns of operation but the aims and objectives of the nurses doing the work have remained remarkedly consistent." The 22 chapters, comprising five parts, are devoted largely to stating the specialist's concept of the nurse's part: in the community program for the development

and protection of children; in planning work with school age children; in individual pupil appraisal and assistance; in general health supervision and education; in working in special situations.

Minute detail of how-to-do and how-not-to-do specific tasks directed toward the beginner in school nursing leads to assumptions and generalizations which are likely to be questioned by others in the fields of public health, medicine, and education.

An interesting history of school nursing in chapter 2 contains abstracts from early writings. Chapter 4 suggests the need for agreement of all national nursing, health, and education groups upon a single statement of required preparation for the nurse working in schools. The content is well indexed. A wide range of references follows each chapter. Addresses of organization and magazines of general interest to those concerned with child health are also listed.

BOSSE B. RANDLE

I Wanted to Live. An Autobiography by Will Ross. *Milwaukee, Wis.: Wisconsin Anti-Tuberculosis Association,* 1953. 162 pp. Price, $2.50.

The title of this book is very significant in relation to its content. It is the personally written story of the experience of a distinguished Wisconsin man who fought and conquered tuberculosis shortly after his graduation from high school in the small town where he was born and grew up. "I wanted to live" is an expression out of his mind and heart while he was battling the disease in a small sanatorium for a period of almost five years.

The time of the story is 45 years ago, when most of present-day knowledge, facilities, and procedures employed in the discovery and treatment of tuberculisis were not known, or if known, were not in use. Will Ross had the very common experience, in eastern and midwestern states, of being advised by the family physician to go to a southwestern state. Leaving a job as reporter on a paper in his home town, he went to El Paso, Tex., where he got another job as reporter. But the work proved too strenuous and he found himself going backward rather than forward in his physical condition. On the advice of the physician whom he had been seeing occasionally he decided to return to his Wisconsin home and in a short time, again on the advice of the family physician, he was a sanatorium patient.

Will Ross tells the story of his wonderfully patient and courageous struggle to accomplish a cure in dramatic fashion and prepares the reader to rejoice with him in his notable success. He resisted the temptation, with the help of the wise sanatorium medical director, to give up the struggle and here is one of the most important and valuable features of this book for the tuberculosis patient, clinician, nurse, or public health worker.

Will Ross wanted to live and the many people throughout this country who came to know and be associated with him after his battle with tuberculosis are sure that he did live the remainder of his 62 years of life to extraordinary effect for himself and many others. He became a highly regarded leader in the voluntary tuberculosis organization in Wisconsin and this country and served as president of the National Tuberculosis Association in 1945. He developed, from a small beginning while he was a tuberculosis patient, one of the largest and most successful hospital supply establishments in the United States and in the course of doing this helped many other former tuberculosis patients by stimulating their courage, giving them employment, and in other ways.

This autobiography of the first half of the life of Will Ross is heart-warming and inspiring. It is spiced throughout with his well known wholesome humor. Its value is much increased by an epilogue written by Harold Holand. The

book will be decidedly rewarding reading for everyone interested in tuberculosis as an individual and public health problem. ARTHUR M. DEWEES

Prophylaxie des Maladies Contagieuses de l'Homme—*Rapport officiel de l'American Public Health Association, 1790 Broadway, New York 19, N. Y.* (Septieme ed.). *Traduit de l'anglais en collaboration avec le ministere de la Sante de la province de Quebec et publie par le ministere de la Sante nationale et du Bien-etre social. Ottawa, Canada,* 1953. 215 pp. Price unstated.

This French translation of the 1950 edition of the report of *The Control of Communicable Diseases in Man,* official with the American Public Health Association, has been made by the Department of National Health and Welfare of Canada in cooperation with the Ministry of Health of the Province of Quebec. Arthur F. W. Peart, M.D., D.P.H., chief of the Epidemiology Division, Ottawa, has carried the responsibility.

This is the first French translation of this volume, except for the abortive attempt undertaken by the Office of War Information during World War II. Along with the Spanish and Portuguese editions and that in Thai, there is reflected the international demand for this volume. The Canadian Department of National Health and Welfare and the Ministry of Health in Quebec are to be congratulated on their industry.

REGINALD M. ATWATER

Patients Are People—*By Minna Field. New York: Columbia University Press,* 1953. 244 pp. Price, $3.75.

Mrs. Field's book is subtitled: "A Medical-Social Approach to Prolonged Illness." The book is that, without question. But it is more — it is objective, stimulating, and hopeful. It tells us that medical science, for all its progress in treatment of prolonged illness, cannot alone salvage the patient and his greatest potentialities.

The thesis of the book is that disease does not cause the patient to lose all his values for himself, his family, and his community. This is discussed in terms of prolonged illness, but many of the approaches to individual problems apply equally well to any illness in any setting.

Chapter 2, "Evolution of a Concept," should be required reading for anyone—physician, nurse, therapist, social worker, health officer—who is concerned with prolonged illness. It provides a perspective on the subject which makes it clear how changes in the concept of medical care led to our present-day concept of total care.

Discussion of such subjects as the meaning of hospitalization to the patient, posthospital adjustment, learning to live with illness, and the impact of illness on the family is enlivened by well phrased case examples, drawn from Mrs. Field's experience at Montefiore Hospital, where so much pioneering in treatment of the patient with prolonged illness has taken place.

PEARL BIERMAN

APHA membership application blank on page XXXIII

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ANTIBIOTICS. Robertson Pratt and Jean Dufrenoy. (2nd ed.). Philadelphia: Lippincott, 1953. 398 pp. Price, $7.50.

COMMUNICABLE DISEASE CONTROL. Gaylord W. Anderson and Margaret G. Arnstein. (3rd ed.). New York: Macmillan, 1953. 500 pp. Price, $6.50.

CURRENT RESEARCH ON VITAMINS IN TROPHOLOGY. Proceedings of the Scientific Sessions of the Eighth Annual Meeting, New York City, March 4, 1953. New York: National Vitamin Foundation, Inc. 157 pp. Price, $1.50.

DRINKING IN COLLEGE. Robert Straus and Selden D. Bacon. New Haven, Conn.: Yale University Press, 1953. 221 pp. Price, $4.00.

GUIDE TO HUMAN PARASITOLOGY FOR MEDICAL PRACTITIONERS. D. B. Blacklock, T. Southwell, and T. H. Davey. (5th ed.). Baltimore, Md.: Williams and Wilkins, 1953. 228 pp. Price, $5.50.

HEALTH SERVICES FOR THE CHILD. Edward R. Schlesinger. New York: McGraw-Hill, 1953. 403 pp. Price, $7.50.

INSECTICIDES. MANUAL OF SPECIFICATIONS FOR INSECTICIDES AND FOR SPRAYING AND DUSTING APPARATUS. WHO, Division of Environmental Sanitation. New York: Columbia University Press, 1953. Price, $8.50.

INTERRELATIONS BETWEEN THE SOCIAL ENVIRONMENT AND PSYCHIATRIC DISORDERS. Papers Presented at the 1952 Annual Conference of the Milbank Memorial Fund. New York: Milbank Memorial Fund, 1953. 265 pp. Price, $1.50.

LAWLESS YOUTH. E. A. Stephens. New York: Pageant Press, 1953. 301 pp. Price, $3.50.

LIVING WITH A DISABILITY. Howard A. Rusk and Eugene J. Taylor. New York: Blakiston, 1953. 207 pp. Price, $3.50.

MENTAL HEALTH IN A MAD WORLD. James A. Magner. Milwaukee, Wis.: Bruce Publishing, 1953. 303 pp. Price, $3.75.

NUTRITIONAL STUDIES IN ADOLESCENT GIRLS AND THEIR RELATION TO TUBERCULOSIS. Joseph A. Johnston. Springfield, Ill.: Thomas, 1953. 320 pp. Price, $7.50.

ORGANIZACION Y ADMINISTRACION PUBLICA DE LA SANIDAD DEL TRABAJO. Enrique Escarra. Santa Fe, Argentina: Libreria and Editorial Castellvi, 1953. 140 pp.

PERIOSTBEHANDLUNG. P. Vogler. Leipzig, Germany: Georg Thieme, 1953. 168 pp. DM 17.—

PREMATURITY CONGENITAL MALFORMATION AND BIRTH INJURY. Proceedings of a Conference June 5–6, 1952, Association for the Aid of Crippled Children. New York: Association for the Aid of Crippled Children, 1953. 255 pp. Price, $4.00.

PROPHYLAXIE DES MALADIES CONTAGIEUSES DE L'HOMME. Rapport officiel de l'American Public Health Association (Septieme ed.). Traduit de l'anglais en collaboration avec le ministere de la Sante de la province de Quebec et publie par le ministere de la Sante nationale de du Bien-etre social. Ottawa, Canada, 1953. 215 pp. Price unstated.

RECREATION FOR THE AGING. Arthur Williams. New York: Association Press, 1953. 192 pp. Price, $3.00.

REHABILITATION OF THE OLDER WORKER. Edited by Wilma Donahue, James Rae, Jr., and Roger B. Berry. Ann Arbor, Mich.: University of Michigan Press, 1953. 200 pp. Price, $3.25.

RENAL FUNCTION. Transactions of the Fourth Conference October 22–24, 1952. Stanley E. Bradley, Editor. New York: Josiah Macy, Jr. Foundation, 1953. 189 pp. Price, $3.50.

THE RETIREMENT HANDBOOK. Joseph C. Buckley. New York: Harper, 1953. 324 pp. Price, $3.95.

SAMPLE SURVEY METHODS AND THEORY. VOL. I. METHODS AND APPLICATIONS. 638 pp. Price, $8.00. VOL. II. THEORY. 332 pp. Price, $7.00. Morris H. Hansen, William N. Hurwitz, and William G. Madow. New York: Wiley, 1953.

THE SAVING GRACE. Willie Carhart Morehead. New York: Vantage Press, 1953. 57 pp. Price, $2.00.

STANDARD METHODS OF CLINICAL CHEMISTRY. (Vol. I.). American Association of Clinical Chemists. New York: Academic Press, 1953. 142 pp. Price, $4.50.

SOME CONJUGATED PROTEINS. Edited by William H. Cole. New Brunswick, N. J.: Rutgers University Press, 1953. 73 pp. Price, $1.75.

THE TROUBLED MIND. Beulah Chamberlain Bosselman. New York: Ronald Press, 1953. 205 pp. Price, $3.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

The Happy-Go-Unlucky Time—The 'teens are the healthy years. The deaths that do occur are chiefly from violence, mostly in automobile accidents. The leading disease cause of death is cancer. These broad facts are probably known to you. The statistical details, with which you may not be familiar, are here and they are truly arresting.

ANON. Health of Teen-Agers. *Statist. Bull. Metrop. Life Insur. Co.* 34, 8:1 (Aug.), 1953.

Servicio—Spanish for Service—Our Public Health Service undertook to evaluate the 10-year-old Servicio program in South America. You were introduced to this broad, cooperative venture by "A Servicio in Action" appearing in our September *Journal*. Here you get some of the details of the findings in five papers. More will follow.

ANON. *Pub. Health Rep.* 68, 9:829 (Sept.), 1953.

This Is About Participation—"When I hear it I forget it/When I see it I remember it/When I do it I know it." (Chinese adage.) The paper, thus quoted, is about teaching medical students, but the pedagogical principles propounded surely apply to a lot of other teaching opportunities. Highly commended to all who teach—and who of us does not?

ALLPORT, G. W. The Teaching-Learning Situation. *Pub. Health Rep.* 68, 9:875 (Sept.), 1953.

People, Not Cases—Here is a pioneering venture that might provide just the right meeting ground where medical practice and public health can find a common denominator. The venture is called the "Family Health Adviser Service" and in it (University of Pennsylvania) medical students act as family counselors for all sorts of health and social problems. May the idea prosper and spread prolifically to other medical schools!

APPEL, K. E. Putting the Family Back in Medical Education. *New England J. Med.* 249, 10:397 (Sept. 3), 1953.

Health Visitors in the Welfare State—Three papers discussing the future of the (British) home visitor seem to agree that she must be not only nurse and social worker, but a psychiatric social worker as well. The rather warm discussion that follows this presentation should interest those of us who have been raised on our tepid way of commenting on program papers.

BOWLBY, J., *et al.* The Application of Recent Research to Health Visiting. *J. Roy. San. Inst.* 73, 5:596 (Sept.), 1953.

What Makes Organizations Run (Badly)?—Would you like to enjoy about 32 quiet chuckles—and quite possibly get some ideas to boot? Then hunt out this paper.

DAVID, G. Your Organization . . . in Sickness and in Health. *Adult Leadership* 2, 4:5 (Sept.), 1953.

"The Great Sewer that Is the Atmosphere"—Three experiences are reported which go to show that something can be done about air pollution provided enough people get worked up over the nuisance and determined officials will take on the job of abating it.

DOYLE, H. N. Polluted Air, a Growing Community Problem (and three supporting papers). *Pub. Health Rep.* 68, 9:858 (Sept.), 1953.

Department of Reciprocity—Good public health practice is good business for the practicing physician. Family

doctors owe it to themselves, their patients, and community to support good public health administration.

GETTING, V. A. The Family Physician and the Public Health Department. *J.A.M.A.* 153, 4:265 (Sept. 26), 1953.

Cure for Parochialism — At their recent national convention the nurses were given this priceless counsel: ". . . invite sociologists to address you, and social psychologists, personnel managers, politicians, government officials, columnists, advertising experts, labor union leaders, educators, economists, lawyers, executives, editors, and historians. Ask them to speak on any subject that they think could bear on nursing." There isn't a specialty in the whole health field that would not profit by this admonition—if the advice were taken to heart—and not the least of these specialties is that of nursing.

GREGG, A. The Opportunities Before Us. *Nursing Outlook* 1, 8:449 (Aug.), 1953.

Why It Wasn't Better—One-third of a group of institutionalized mental defectives received influenza A vaccine, one-third B, and one-third saline. Three and a half months later, an influenza B epidemic dutifully put in an appearance. Don't be satisfied with the news that significant protection was found where it should be: there are other findings of greater use to you here.

HENNESSY, A. V., *et al.* An Experience with Vaccination Against Influenza B in 1952 by Use of Monovalent Vaccine. *Am. J. Hyg.* 58, 2:165 (Sept.), 1953.

Via Group Discussion—Two sentences seem to characterize an entire issue of this always-stimulating (British) publication: ". . . the aim of health educationists is to modify people's assumptions relevant to health so that they are able to accept new information and use it effectively. . . . The aim of free group discussions is to establish conditions in which (people) can become consciously aware of (their) assumptions in a situation in which it is possible to examine them and modify them."

JOHNSON, M. L. Theory of Free Group Discussion (and six related papers). *Health Ed. J.* 11, 3:112 (July), 1953.

Science Marches On — State by state, all the communities that fluoridate public water supplies are listed here. The Public Health Service estimates (May, 1953) that 14,350,000 people in 777 communities are receiving fluoridated water. In addition 357 towns or cities (15,800,000 total population) have approved but not installed such treatment. (There are several useful articles on fluoridation and defluoridation accompanying this committee report.)

PHILLIPS, R. S. Census of Fluoridation in the United States and Canada, 1952. *J. Am. Water Works A.* 45, 8:893 (Aug.), 1953.

New Area Explored—(Mostly for the novelty of its concept this paper is dragged by the hair into the Annotated Bibliography). In most pediatric papers preemies have incubators, and air conditioners, and hard-and-fast nursing schedules, etc., but no mothers—and certainly no fathers! Here, they have both.

PRUGH, D. G. Emotional Problems of the Premature Infant's Parents. *Nursing Outlook* 1, 8:461 (Aug.), 1953.

Employee Health — Somewhere in this discussion of industrial medical and health services for small plants the words "public and private health agencies" appear—once! May not this be taken as not so much a reflection of the writer's bias, as a reflection upon the lateness of our (public health's) entrance into the industrial health field—and our inadequacies?

RIEKE, F. E. Private Practices in Small Industry. *J.A.M.A.* 153, 3:198 (Sept. 19), 1953.

Bottle Babies Bigger—In the interest of fair play only—these bibliographies having boosted breast-feeding papers interminably—two English researches are called to your attention: they find no clear evidences of the superiority of breast feeding discernable among two large groups of babies followed through their first year.

STEWART, A., and WESTROPP, C. Breast-Feeding in the Oxford Child Health Survey. *Brit. M. J.* 4831, 305 (Aug. 8), 1953.
(See also) SIMPSON, A. S. Breast Versus Artificial Feeding: Influence on Weight Gain. *M. Officer 90*, 8:85 (Aug. 22), 1953.

Depths of Our Ignorance—A physicist impales himself on the unyielding horns of the matter-force dilemma, a biologist reveals how little we really know about embryonic differentiation of cells, a neurologist makes some shrewd guesses about ways by which memory might possibly work. Other scientists parade their basic ignorances of what is at the very bottom of the particular field of their interest. Is it ever worth while for us to look up, each from his little technologic preoccupations, to have our wits disturbed by all this fumbling for ultimate truth? If you think it is, here is your chance to be disturbed.

WEAVER, W., *et al.* Fundamental Questions in Science (and eight related papers). *Scient. American* 189, 3:47 (Sept.), 1953.

If additional information is desired regarding the articles listed in this Bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Adult Leadership, Adult Education Association of the United States, 743 N. Wabash Ave., Chicago 11, Ill.
Am. J. Hyg. (American Journal of Hygiene), 615 N. Wolfe St., Baltimore 5, Md.
Health Ed. J. (Health Education Journal), Tavistock House, Tavistock Sq., London, W.C. 1.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago 10, Ill.
J. Am. Water Works A. (Journal of the American Water Works Association), 521 Fifth Avenue, New York 17, N. Y.
J. Roy San. Inst. (Journal of the Royal Sanitary Institute), 90 Buckingham Palace Road, London, S.W. 1.
M. Officer (The Medical Officer), Whitefriars House, 72–78 Fleet St., London, E.C. 4.
New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.
Nursing Outlook, American Journal of Nursing Company, 2 Park Ave., New York 16, N. Y.
Pub. Health Rep. (Public Health Reports), Superintendent of Documents, Gov. Ptg. Office, Washington, D. C.
Scient. American (Scientific American), 2 West 45th St., New York 19, N. Y.
Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin Metropolitan Life Insurance Company), 1 Madison Avenue, New York 10, N. Y.

ASSOCIATION NEWS

COMMUNICABLE DISEASE CONTROL IN FRENCH EDITION

The Department of National Health and Welfare, Ottawa, Canada, has published a French translation of the APHA official volume *The Control of Communicable Diseases in Man*, 1950 edition. Arthur F. W. Peart, M.D., D.P.H., chief of the epidemiology division, was in charge of the translation. Copies of the French edition have been made available in Quebec to the French-speaking areas of Canada.

The seventh (1950) edition of this volume has been translated also into Spanish and Portuguese under the auspices of the Pan American Sanitary Bureau, World Health Organization, Washington. The translation into German is in process. A second translation into Thai has been completed.

Preparations are under way for the eighth edition of this manual to be published in 1955 under the auspices of a subcommittee chaired by John E. Gordon, M.D., Ph.D., professor of epidemiology at the Harvard University School of Public Health, Boston, Mass.

SUPERVISION OF TUBERCULOSIS

The Committee on Administrative Practice has published a *Guide for the Medical and Public Health Nursing Supervision of Tuberculosis Cases and Contacts.* It was prepared by a subcommittee under the chairmanship of Edward X. Mikol, M.D. The statement has been carefully developed by public health experts active in the field of tuberculosis control. Ira V. Hiscock, chairman of the Committee on Administrative Practice, describes it as a thoroughly practical, simply written, schedule of administrative procedures. He states that it provides a sound, scientific basis for making selections, assigning priorities, and taking actions which will improve the control of tuberculosis and conserve public health nursing services. From the APHA; 30 cents.

DR. SMILLIE APPOINTED CONSULTANT ON ACCREDITATION

Roy J. Morton, C.E., chairman of the APHA Executive Board, and Leroy E. Burney, M.D., chairman of the Committee on Professional Education, announce the appointment of Wilson G. Smillie, M.D., Dr.P.H., as consultant to the Committee on Professional Education for the accreditation of schools of public health, effective October 1, 1953.

Dr. Smillie has been an active member of the Association since 1917 and a Fellow of the Epidemiology Section since 1930. A native of Colorado, he received his undergraduate degree at Colorado College and his medical degree and doctorate of public health at Harvard University. Dr. Smillie served for some years on the field staff of the Rockefeller Foundation and for two years was director of the Institute of Hygiene at Sao Paulo, Brazil. In 1928 he joined the faculty of the Harvard School of Public Health as professor of public health administration, leaving in 1937 to become professor of public health and preventive medicine at Cornell University Medical College, New York City, a position he still holds. Dr. Smillie is the author of the well known textbooks *Public Health Administration in the United States* and *Preventive Medicine and Public Health.*

Dr. Smillie succeeds Dr. C.-E. A. Winslow who has asked to be relieved of this assignment. Dr. Winslow did the pioneer work in this accreditation project now in its seventh year. His summary report, *The Accreditation of North American Schools of Public Health,* is receiving attention both in this country and abroad.

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Public Health Physician — as health officer for established county health department of 37,000 in northwestern Illinois. $7,200–$9,000, plus travel allowance. Qualified physician may start above minimum. President, Lee County Board of Health, 123 E. First St., Dixon, Ill.

Public Health Physician I (Communicable Disease)—supervises physicians in an assigned health district investigating and controlling diseases and health problems (occurring in private homes, hospitals, and institutions); consults on the control and diagnosis of communicable diseases. Four years of professional medical training and experience in preventive medicine, including satisfaction of the formal requirements for certification by the American Board of Preventive Medicine.

Public Health Physician I (Maternal and Child Health)—supervises physicians working with preschool and school children in diagnosis, treatment, and prevention of diseases, and evaluates work of the well child clinics; assists in development and initiation of a maternal health program, coordinating program with private agencies. Four years of professional medical training and experience in obstetrics or pediatrics, including satisfaction of formal requirements for certification by the American Board of Obstetrics and Gynecology or American Board of Pediatrics.

Public Health Physician I (Venereal Disease)—supervises physicians assigned to clinics; confers with other agencies and groups concerned with the control and treatment of venereal disease. Four years of professional medical training and experience in venereal disease control, including satisfaction of formal requirements for certification by the American Board of Dermatology and Syphilology.

Public Health Physician I (Tuberculosis)—supervises physicians engaged in diagnosis, care and treatment of chronic diseases of the chest; advises and consults with interested groups in problems of tuberculosis control. Four years of professional medical training in internal medicine, including satisfaction of formal requirements for certification by the American Board of Internal medicine.

In addition, each of the Public Health Physician positions requires one year's experience in public health, $7,777 for full time, $5,444 for half time.

Dept. of Public Health, Room 503, City Hall Annex, Philadelphia, Pa.

Health Officer—for Greater Anchorage Health District of 60,000 population, equivalent to local city-county health department. Full-time local staff of 13 with anticipated additions to staff during current fiscal year. Formal public health training, plus two years' experience in public health administration required. Substitutions permitted. Salary open depending on qualifications. Transportation paid from Seattle to Anchorage. Dr. C. N. Hoveland, Chairman, Board of Health, 217 E. St., Anchorage, Alaska.

Health Officer—for established county health department. Approved medical school, one-year experience in public health administration, between ages 28 and 40 (will accept up to age 55 if sufficient experience). Florida license not required for two years. $7,500–$8,400 depending upon classification. Rapid advancement for good performance. Position must be filled quickly, inquire for particulars. Wilson T. Sowder, M.D., State Health Officer, Box 210, Jacksonville 1, Fla.

Health Officer — Clackamas County, Ore., in beautiful Willamette Valley. Population 86,716. $9,000–$11,000, depending on qualifications. Must have M.P.H. degree and preferably some public health experience. Medical licensure in Oregon required for continued employment. Personal interview required. A. T. Johnson, Merit System Supervisor, Oregon Merit System Council, P. O. Box 231, Portland 7, Ore.

Assistant Director — Division of Local Health Services, Kentucky. $11,000. A real challenge to the right man. Bruce Underwood, M.D., Commissioner of Health, Kentucky State Dept. of Health, 620 S. Third St., Louisville, Ky.

Director of Health Education — for Denver Department of Health and Hospitals. Developing and administering a health education program in an agency

providing public health and medical care services. Requirements: M.P.H. in education, at least five years' responsible experience in public health education, including demonstrated ability to plan and administer a public health education program. $5,496–$6,900. Personnel Office, Dept. of Health and Hospitals, West 6th Ave. and Cherokee St., Denver 4, Colo.

Health Educator—immediately for voluntary health agency in large city. M.P.H. or M.A. in health education. Spanish speaking. Responsible experience in community health education of at least one year, preferably more. Salary depending on qualifications. **Write: Box HE-56,** Employment Service, APHA.

Public Health Dentist — Michigan licensed or Board qualified. Duties are clinical and educational. Must be draft exempt and under 40 years of age. Child Health Division, Children's Fund of Michigan, 660 Frederick St., Detroit 2, Mich.

Public Health Dentist — to administer community dental health program and initiate research and education in dental health. Requires three years of dental experience including two years' administrative or supervisory experience in organized public health program, completion of courses or residency in pedodontia and graduate work to level of M.P.H. $9,333. Dept. of Public Health, Room 503, City Hall Annex, Philadelphia, Pa.

Sanitarians—San Diego County Health Department. Permanent Civil Service appointments. Requirements: United States citizenship, age 21–54, California registration as sanitarian, minimum of one-year experience in a recognized local public health agency. $327–$378. County Civil Service, 402 Civic Center, San Diego, Calif.

Sanitary Engineer—to direct sanitation program for Maricopa County (Phoenix). Liberal vacations. To $7,000, depending on qualifications. John M. Posegate, Merit System Supervisor, State Office Bldg., Phoenix, Ariz.

Nutritionists — for public health program; university graduates with masters' degrees in nutrition or in public health and preferably postgraduate course in an accredited hospital. $4,225–$4,564 per year.

Head Dietitian (Administrative) — $5,130–$5,811 per year. Involves planning and coordinating overall dietary activities of several large municipal hospitals with centralized staff capacity. Minimum qualifications: university graduation with specialization in foods and nutrition and completion of one year's training as dietetic intern in approved hospital, plus considerable experience in supervising food preparation and service. Detroit Civil Service Commission, 735 Randolph St., Detroit 26, Mich.

Public Health Nurse—for organized county health department in southwestern Michigan. County hospital and health department under joint director. Program generalized (except bedside care). In lake area, shopping centers, and educational facilities readily accessible. Month's vacation, mileage (car necessary). Public health training required, experience desirable. Beginning salary $3,400. V. N. Slee, M.D., Barry County Health Dept., Hastings, Mich.

Public Health Nurses I — $4,107 to start. Wayne County Civil Service Commission, 2200 Cadillac Tower, Detroit 26, Mich.

Public Health Nurse — Public health nursing degree required. Immediate appointment. $328. Car furnished. County retirement plan. Hospitalization available, Donald F. Williams, M.D., Health Officer, Route 2, Box 209 Hanford, Calif.

Staff Nurses — for generalized public health nursing program in large urban area. Good supervision. Salary depends on preparation. $3,114–$3,768. Car not required. Student program. Near university carrying public health nursing program. Mildred V. McIntyre, Cleveland Division of Health, Room 17, City Hall, Cleveland 14, Ohio.

Public Health Nurse — Ulster County Department, in both urban and rural areas. $3,000–$3,360 with three annual increments. County car available. Three weeks vacation. Dr. Dudley W. Hargrave, Health Commissioner, 15 Main St., Kingston, N. Y.

Director of Nurses and Two Staff Nurses for small progressive county health department in capital district of up-state New York. Ward L. Oliver, M.D., Commissioner Schoharie County Health Dept., Schoharie, N. Y.

Director, Public Health Nursing—on or before December 1, 1953. General program, including school nursing in semi-rural area of 65,000, with budgeted staff of 20, including six public health nurses and a clinic nurse. $391–$486. Transportation is furnished. Richard C. Murphy, M.D., Director of Public Health, Butte County Health Dept., 2430 Bird St., Oroville, Calif.

Public Health Nurse—for generalized program in urban community of 40,000, 75 miles from New York City; three weeks' vacation; travel allowance eight cents per mile. $3,060–$3,755; may start above minimum salary depending upon qualifications. Dept. of Health, 24 Washington St., Poughkeepsie, N. Y.

Qualified Public Health Nurse—City of Flint. $3,783, automatic increments to $4,498 in four years. Generalized nursing program. Flint Civil Service Commission, City Hall, Flint, Mich.

Assistant Director—Visiting Nurse Association of Cleveland. Staff includes an educational director, plus 56 other budgeted positions. Generalized program with large expectant parents' program and large student program. Salary $5,500–$6,000, depending on qualifications and experience. Position available immediately.

Public Health Nurses—for staff positions. One-month vacation. Tuition allowance for part-time study at Western Reserve University. Student program and expectant parents' program with opportunities for teaching. $3,240–$3,870, depending on preparation and experience. Cynthia A. Dauch, Director, Visiting Nurse Association, 3300 Chester Ave., Cleveland 14, Ohio.

POSITIONS WANTED

Public Health (Sanitary) Engineer—Five years' experience with county and state health departments and also as a sanitary engineer for a consulting engineer. Desires permanent responsible position in East or Midwest. Willing to travel. John D. Cohen, 1405 Edgewood Ave., Trenton, N. J.

Health and Medical Film Specialist, M.D., New York City resident, available as consultant to organizations, sponsors, and physicians to assist in production planning of motion pictures. Write: **Box M-10**, Employment Service, APHA.

Health Educator—M.A., over two years' experience in community organization with diversified groups, industrial education, and professional societies; three years' public relations experience in New York City; able speaker, writer. David Miller, 785 East 181st St., N. Y.

Health Educator—P.H.N. and M.A. Experience in nursing education, community organization, and as public health coordinator in a school of nursing. Six years' teaching social sciences. Would consider working with a well established clinic group. Prefer Midwest. Write: **Box HE-59**, Employment Service, APHA.

Public Health Veterinarian with M.P.H. degree, now on foreign service, desires position with local or state health department; age 31, married. Write **Box V-16**, Employment Service, APHA.

All communications on the following advertisements should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

WANTED: (a) Public health physician, preferably Diplomate, to serve as chief of staff, foreign operations, large industrial company. (b) Medical consultant; major philanthropic organization; duties involve some travel. (c) Director, metropolitan school health program; Midwest. (d) Health commissioner; university town, 70,000. (e) Public health nurse well qualified in teaching; state college; faculty rank; $5,000–$5,500. (f) School nurse; Southern California. (g) Head, university department public health nursing; rank: assistant professor; minimum $6,000. (h) PH nurse or health educator; regional director, community organization; duties involve some fund raising; large city; Midwest. (i) Public health nurse or health educator to serve as executive secretary; county health agency. (j) School nurse, head program; Chicago suburb. (k) Sanitary engineer; state department; East. (l) Health educator; state health department; West.

Burneice Larson, Medical Bureau, Palmolive Building, Chicago, Ill.

OPPORTUNITIES WANTED

(a) Public health statistician; PH; eleven years, directing departments, vital and public health statistics. (b) Public health nursing administrator; M.A.; four years, director nursing service, state health department. (c) Public health physician; M.P.H.; Diplomate; nine years, director, city health department. (d) Health educator; M.S., D.P.H.; five years' teaching; seven years' educator; state health department. (e) Sanitarian; B.S.; year's graduate training, Environmental Sanitation; eight years, state health department. All negotiations strictly confidential. Burneice Larson, Medical Bureau, Palmolive Building, Chicago, Ill.

NEWS FROM THE FIELD

WHO NEWS

Regional Committee Meetings

Europe

The third session of the Regional Committee for Europe met in Copenhagen, September 7–10, with the main task of preparing a program and budget for 1955. A budget of $1,600,000 was recommended, about half of which would come from regular WHO funds, and the remainder from TCA, UNICEF, and other agencies having joint arrangements with WHO.

Among program items approved are a conference on modern trends in tuberculosis control, study groups, respectively, on water standards and on teaching methods for nurses. An extensive fellowship program in various medical fields was approved for continuation in 1955. The study of sanitary engineering terminology in English and French, already begun, will be continued. About a fifth of the 1955 budget will be devoted to the control of certain communicable diseases that still cause concern in some European countries—diphtheria, venereal diseases, enteric fever, and malaria—tuberculosis in Turkey, Greece, Finland, and Austria; whooping cough in Yugoslavia; trachoma in Tunisia and Morocco.

Among other decisions taken by the committee were:

1. Recommendation that Geneva be the permanent headquarters of the Regional Office, but in quarters outside the WHO headquarters in the Palais des Nations.

2. Recommendation that the two associate members, Tunisia and Morocco, be given full voting rights in the committee, and that all regional committees give full voting rights to associate members.

3. Confirmation of the decision to meet in Yugoslavia in 1954 and acceptance of the Austrian government's invitation to meet in Vienna in 1955.

Dr. J. Frandsen, director general of the Danish National Health Service, was elected chairman.

Southeast Asia

The sixth session of the Southeast Asia Regional Committee was held in Bangkok, September 16–19, with Dr. Abdul Rahim of Afghanistan as chairman. The new WHO director-general, Dr. M. G. Candau, addressed the meeting, stressing especially the importance of WHO's work in furthering economic development and world peace. A budget of $3,600,000 for 1955 was recommended.

The report of the regional director, Dr. Chandra Mani indicated a gradual shift in emphasis in the regional work over the past four years. From projects devoted mainly to demonstrating methods for the control of the most important communicable diseases, there has been a trend toward expanding programs of education and training of national staffs, particularly in the fields of medical education, nursing, and maternal and child health.

Western Pacific

The fourth session of the Western Pacific Regional Committee met in Tokyo, September 3–8. In presenting his review of the year's activities, the regional director, Dr. I. C. Fang, called attention particularly to the developments in the field of health education. One country has been assisted in developing a long-range health education program, for example. To meet the requests of a number of countries a regional public health education conference is envisioned for 1955.

The committee recommended a 1955 budget of $1,942,151 for action by

WHO's executive board. It elected Dr. Takemune Soda, chief representative of Japan, chairman for the coming year. It voted to hold the next meeting in Manila in September, 1954, and the 1955 meeting in Singapore. Among the decisions or recommendations made were:

1. Recommended that full voting rights at regional committee meetings be granted to associate members, but this to be accompanied by an increased contribution to WHO's regular budget.
2. A region-wide survey of smallpox.
3. A resolution calling for preparation of a five-year program for future consideration of the committee.
4. A malaria control conference in Taiwan in 1954, together with a recommendation for integrating national control programs into an eventual regional program.

The retiring chairman, Katsumi Yamagata, Japanese minister of health and welfare, in the closing address spoke of the permanent benefits to the whole region resulting from the work of the committee. Other suggestions of speakers were that governments inform people of their countries of WHO aims and activities in order to develop widespread public support for its cooperative efforts to raise health levels. The resolution of UNESCO was also affirmed calling for the planning of programs that promote community development in the broad sense and the full use of the contributions that other UN agencies are able to make.

Malaria Can Be Eliminated in Asia

With more than 50 participants from 20 Asian countries, the first Asia-wide Malaria Conference called by WHO met in Bangkok, September 21–24. The conference concluded that malaria can be eliminated within a matter of years from areas in which a quarter of the world's population lives, with consequent salutary effects upon agriculture, industry, and the national economy generally. For example, it is estimated that in an area of Thailand, with 280,000 inhabitants, control work within the first year prevented over 50,000 malaria cases with a resulting saving of 175,000 man-days of labor. The 10 million man-days of labor lost annually in that country because of malaria constitute a money loss sufficient to maintain a permanent control program in the country for 15–20 years, according to Melvin Griffith, Ph.D., of the U. S. Foreign Operations Administration in Thailand.

The conference recommendations, calling for a strong permanent malaria control organization in each Asian country where the disease is a major problem and for maximum coordination among countries, will be circulated to participating countries. On the final day a 25-page document was adopted summing up the results of the conference.

Dog Vaccination the Rabies Answer

The seven-member Expert Committee on Rabies met in Rome, September 14–19. Here the new and hopeful developments in rabies control resulting from large-scale experiments sponsored by WHO in Greece, Israel, Malaya, and a number of other countries were examined and evaluated. The countries in which these experiments were carried out found that mass vaccination of dogs with the new avianized vaccine, coupled with the destruction of stray animals and the control of wildlife, was the key to success. For example, vaccination of dogs in Malaya began late in 1952, a year in which 198 known canine cases had occurred. In the first seven months of 1953 only 15 cases were reported.

The committee also gave final approval for publication of the text of the WHO *Manual of Laboratory Techniques in Rabies*. This, it is reported, will be of great importance in standardizing the complicated laboratory procedures needed in rabies work, as well as making easier the comparison of results of experiments carried out in various countries.

Chairman of the Expert Committee meeting was Karl Habel, M.D., chief of the Laboratory of Infectious Diseases of the Public Health Service's National Microbiological Institute in Bethesda. Other members were from the Pasteur Institutes of Paris, Iran, and Southern India; the Rockefeller Foundation in Poona, India; the National School of Public Health of Madrid; the director of the Virus Diseases Section in Haifa, Israel; and the Lederle Laboratories of Pearl River, N. Y. Ernest S. Tierkel, V.D.M., of the Veterinary Public Health Services of the Public Health Service, Communicable Disease Center in Atlanta, Ga., and M. M. Kaplan, V.D.M., veterinary officer of WHO in Geneva, were the secretariat of the meeting.

A First Report on Bilharziasis

The WHO Expert Committee on Bilharziasis has issued the report of its first meeting at the School of Medicine, University of Puerto Rico in October, 1952. The technical information on molluscicides is given in some detail in view of its practical importance to health administrations, and because it is still unpublished elsewhere. The control of the molluscan intermediate hosts is considered under two headings, the application of poisons, and the control of the snail environment. In addition to copper sulfate and calcium cyanamide, the more promising chemical poisons are phenolic compounds, a halogenated hydrocarbon, and some organic phosphorus compounds. On the basis of availability and cost, pentachlorophenol or its salts appear to be the ones of choice. To apply biological methods of control, more complete data are needed on snails and their ecology. The report says, "The successful attack on this disease will be accomplished by a team, the engineer, the malacologist, the parasitologist, the sanitarian, the physician and the chemist . . ."

Expert Committee on Bilharziasis, First Report. WHO Technical Reports Series No. 65, Columbia University Press, 2960 Broadway, New York 27; $.30.

DR. MOUNTIN MEMORIAL VOLUME

A national committee, composed largely of public health workers, is sponsoring the publication of a memorial volume of the writings of the late Joseph W. Mountin, M.D. The volume is "intended to reflect Dr. Mountin's diversity of interests, breadth of vision, and the pioneering nature of his work in many of the branches of public health work." It is expected, also, that it will serve "as a basic document for students and practitioners in public health."

Leonard A. Scheele, Surgeon General of the Public Health Service, is honorary chairman of the committee. Drs. Thomas Parran and Joseph O. Dean are co-chairmen, and Mayhew Derryberry is serving as executive secretary. Additional information, including a plan of the project, may be secured from and contributions sent to Joseph W. Mountin Memorial, P. O. Box 1610, Washington, D. C.

GRANTS FOR CANCER RESEARCH SCHOLARS

Applications for grants for scholars in cancer research are being accepted by the Committee on Growth of the National Research Council, acting for the American Cancer Society. These awards are designed to bridge the gap between the completion of fellowship training and the period when the young scientist has thoroughly demonstrated his competence as an independent investigator. A grant of $18,000, payable over three years, will be made to each scholar's institution as a contribution toward his support, his research, or both. An institution may submit more than one application. Applications should be submitted by institutions on behalf of a candidate prior to January 1, 1954.

Additional information may be ob-

tained from the Executive Secretary, Committee on Growth, National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C.

LECTURES TO THE LAITY IN NEW YORK

The first of a series of six biweekly lectures to the laity is being given at the New York Academy of Medicine on November 4 by Norbert Wiener, Ph.D., professor of mathematics, Massachusetts Institute of Technology. His subject, "The Application of Physics to Medicine," bears out the theme of the current series, "The Reciprocal Relations between Medicine and the other Disciplines." Later speakers include a chemist, a psychiatrist, an anthropologist, an attorney, and an artist. These lectures have been given annually for the past 18 years. At the Academy Building, 2 E. 103rd St., New York, they are open to the public without charge or tickets of admission.

SCHOOLS FOR DENTAL HYGIENISTS

On the first list of accredited schools for dental hygienists published by the Council on Dental Education of the American Dental Association, 21 schools are included. Of these, 18 were fully approved, three provisionally.

In releasing the list, Shailer Peterson, Ph.D., secretary of the council, said that there are now 6,000 dental hygienists in the United States licensed by boards of dental examiners in every state.

The list is available from the Council, 222 E. Superior St., Chicago 11.

A CALIFORNIA COUNTY ORGANIZES

El Dorado County, by action of its Board of Supervisors on July 1, 1953, is the 43rd of California's 58 counties to provide organized full-time public health services for its citizens. The resident population is 16,400, which is augmented by many thousands annually in the Lake Tahoe and other recreational areas. The county is now eligible for state and federal funds. The health officer is Angus A. McKinnon, M.D., who has already served on a part-time basis since 1927.

PERSONALS

JAMES AIKEN,† former sanitary engineer, Division of Sanitation, Kansas State Board of Health, is now director of sanitary engineering activities, Wichita-Sedgwick County Department of Public Health.

PAULO CESAR DE AZEVEDO ANTUNES, M.D., Dr.P.H.,* has resigned as dean of the faculty of public health, University of Sao Paulo, Brazil, to become secretary of health for Sao Paulo State.

WILLIAM M. BUSCH, formerly in the Kansas State Insurance Department, has been appointed attorney, business manager, and acting director of the Division of Vital Statistics, Kansas State Board of Health, Topeka, succeeding EUGENE W. HIATT, now director of purchasing in the new State Department of Administration.

HOLLAND M. CARTER, M.D., M.P.H.,* health officer of Colleton-Dorchester Counties, S. C., has been assigned to an expanded jurisdiction by the State Board of Health, including Allendale County located in the area of the Savannah River Project, AEC Plant.

DEAN A. CLARK, M.D.,* general director, Massachusetts General Hospital, Boston, has been appointed clinical professor of preventive medicine in the Harvard Medical School. He is a Diplomate of the American Board of Preventive Medicine, Inc.

DOROTHY COLLINS, former medical social consultant, Lincoln-Lancaster Health Department, is now medical social consultant, Tuberculosis Control Division, Nebraska State Health Department, Lincoln.

WILLIAM R. DONOVAN, M.D.,* formerly district state health officer in charge of the Geneva (N.Y.) district and acting health commissioner of the Seneca County Health Department, has been appointed director of the White Plains regional office, New York State Health Department.

LOUIS DREXLER, personnel director, National Tuberculosis Association, has resigned in order to become a graduate student in hospital administration in the Department of Preventive Medicine and Public Health, Yale University School of Medicine, New Haven, Conn.

J. N. DUDLEY, M.D.,* commissioner of health, Roanoke, Va., since 1946, has resigned effec-

tive August, 1953, to accept a position with the Lovelace Clinic, Albuquerque, N. M.

STEPHEN FALKLAND, M.D., Dr.P.H.,† formerly deputy chief, Health Division, United Nations Relief and Works Agency in Beirut, is now assistant medical officer of health, City of Ottawa, Ontario, Canada.

SIDNEY FARBER, M.D., scientific director of the Children's Cancer Research Foundation, Boston, Mass., professor of pathology at Harvard University Medical School at the Children's Hospital, has been appointed a member of the National Advisory Cancer Council, Public Health Service.

CHARLES A. FARISH,* formerly principal sanitary engineer, South Carolina State Board of Health, and JACK MCALLISTER, formerly with the Indiana State Health Department's branch office at La Porte, have joined the staff of the Testing Laboratory of the National Sanitation Foundation, Ann Arbor, Mich.

JEAN S. FELTON, M.D.,* formerly medical director, Oak Ridge National Laboratory, Oak Ridge, Tenn., has been appointed director of health service, University of Oklahoma Hospitals, Oklahoma City, and also as associate professor in the Departments of Medicine and of Preventive Medicine and Public Health at the university's School of Medicine. He will establish the medical school's first course in industrial medicine.

HENRY M. FREIDMAN, M.D., medical supervisor, U. S. Foreign Quarantine Service, Port of New York, with the Public Health Service, retiring after more than 45 years of service, recently received the Superior Service Award of the Department of Health, Education and Welfare, the highest given by the department.

MARCENE GABELL, has been appointed executive secretary, American Association of Psychiatric Social Workers, New York, N. Y.

CARLOS LUIS GONZALEZ, M.D., Dr.P.H.,† former director of public health in the Venezuelan Ministry of Health and Social Welfare, Caracas, has resigned to become chief of the Public Health Division, Pan American Sanitary Bureau, Washington, D. C.

WILLIAM W. HAMMOND, formerly assistant to the personnel director, American Broadcasting Company, has joined the Personnel and Training Division of the National Tuberculosis Association, New York, N. Y.

EVA R. HAWKINS, librarian, National Health Library, New York, N. Y., has been appointed chairman of the Biological Science Division, Special Libraries Association, in preparation for the Cincinnati 1954 meetings.

HENRY C. HUNTLEY, M.D.,* director of disease control, West Virginia State Department of Health, has resigned to become a medical consultant, Federal Civil Defense Administration, Region II, which includes West Virginia and neighboring states, with headquarters in West Chester, Pa.

J. DONALD KINGSLEY, former UN agent general for the Korean Reconstruction Agency and former director general of the International Refugee Organization, has been appointed executive director of the Welfare and Health Council of New York City, succeeding RAYMOND M. HILLIARD, resigned. AUBREY MALLACH,* deputy executive director, has resigned to join the Joint Distribution Committee in Israel.

HENRY W. KUMM, M.D., Dr.P.H.,* who has served for many years as a staff member of the Rockefeller Foundation, has been appointed director of research, National Foundation for Infantile Paralysis, New York City, succeeding HARRY M. WEAVER, Ph.D.,† resigned.

STEPHEN V. LUDDY, D.D.S., M.P.H.,† for the past three years associate professor, Prosthetic Department, Loyola University, New Orleans, La., is now acting director, Partial Denture Division, Prosthetic Department, St. Louis University Dental School, Mo.

HARVEY G. MCANDREWS, most recently milk and food consultant for a five-state Public Health Service region with headquarters in Denver, is now director of sanitation, Kentucky State Health Department, Louisville.

WILLIAM J. MCCONNELL, M.D.,* assistant medical director, Metropolitan Life Insurance Company, New York City, is now in charge of the Safety and Occupational Health Bureau of the Metropolitan in which are merged occupational health and safety services.

REINALD MCCRUM, M.P.H., has been appointed health educator by the Albany New York Tuberculosis and Public Health Association.

CLARKE W. MANGUM, JR., M.D.,* of the Public Health Service, has returned from Greece where he was deputy director of the Public Health Advisory Group of the Foreign Operations Administration Mission to Greece. He has been assigned to the Division of Chronic Disease and Tuberculosis, Heart Section, Public Health Service, Washington, D. C.

GEOFFREY M. MARTIN, M.D.,† has resumed his duties as director, Division of Maternal and

* Fellow.
† Member.

Child Health, Kansas State Department of Health, after a year's postgraduate study at Harvard University, where he received his master's degree in public health. PATRICIA SCHLOESSER, M.D., who served as acting director while Dr. Martin was on educational leave, is now pediatric consultant of the division.

ROBERT C. MILLIGAN, M.P.H.,* has returned from Thailand after an assignment as health educator with an American government enterprise and has been made director of health education, State Department of Health of Pennsylvania in Harrisburg.

GUSTAVO MOLINA, M.D., M.P.H.,† professor of public health administration, School of Public Health, University of Chile, Santiago, and founder of the Chilean Public Health Society, has been made chief of the Professional Education Branch, Division of Education and Training of the Pan American Sanitary Bureau, Regional Office of WHO, Washington, D. C.

HOWARD E. MOSES, director, Bureau of Sanitary Engineering, Pennsylvania State Department of Health, has been made chairman of the Ohio River Valley Water Sanitation Commission which represents eight states in the region that are united in a compact for stream cleanup of the Ohio River Basin.

HARRY MOST, M.D.,† professor of preventive medicine, New York University College of Medicine, New York City, has succeeded HENRY E. MELENEY, M.D.,* as Hermann M. Biggs professor of preventive medicine (acting), and acting chairman of the Department of Preventive Medicine.

HELEN NAHM has been appointed associate director, National League for Nursing, New York City, and director of its Division of Nursing Education, succeeding JULIA MILLER, resigned.

JAY B. NASH, Ph.D.,† has retired as chairman of the Department of Physical Education, Health and Recreation of New York University, New York City, after 23 years in the position and has accepted a Fulbright lectureship at the University of Delhi, India, where he will direct programs for teacher training in the next two years.

EDWARD W. PALMER, Ed.M., M.P.H.,† formerly health director, Beverly (Mass.) Public Schools, has been appointed secretary, Health Division, United Community Services, Omaha, Neb.

A. DENTON OGDEN, M.B.E., F.R.S.I., chief sanitary inspector, Chelmsford R. D. S., Essex, England, who is also chairman of the Council, Royal Sanitary Institute, London, has arrived in the United States to attend the 81st Annual Meeting of the American Public Health Association as an official delegate. He will also travel for six weeks among health departments with interest in sanitation.

GEORGE V. PARMELEE of the American Society of Heating and Ventilating Engineers is in Israel where, as a UN technical assistance expert, at the request of the Israeli government, he is advising on indoor climate research, with particular emphasis on means of natural ventilation and protection from the sun.

ANTONIO LAMAS PARRA, M.D., has been designated by the President of Cuba as general technical administrative vice-director of the Finlay Institute, Havana.

JULIE PERRIN, at one time director of public information, American Social Hygiene Association and since 1947 a member of its board, has been appointed program consultant of the American Heart Association to assist affiliated associations in 11 Pacific and Rocky Mountain states, with headquarters in San Francisco.

ELIZABETH KERR PORTER, Ph.D., head of the advanced professional program at Western Reserve University's Frances Payne Bolton School of Nursing and president of the American Nurses' Association, has been named dean of the nursing school.

LEE POWERS, M.D.,* executive officer of the Department of Public Health and Preventive Medicine, University of Washington School of Medicine, Seattle, has been named head of the Department of Preventive Medicine, American University Medical School at Beirut, Lebanon.

WALTER B. QUISENBERRY, M.D., M.P.H.,* director of the Division of Preventive Medicine, Territorial Health Department, Honolulu, was official representative of the American Medical Association at the 1953 Annual Meeting of the British Medical Association where he participated in a panel on "Cancer and the Community."

BUEL REAGAN, M.P.H.,† formerly with the Tompkins County (N.Y.) Health Department, has been appointed senior public health education consultant, Washington State Department of Health, Seattle.

FRANK L. RECTOR, M.D.,* secretary of the Cancer Control Committee, Michigan State Medical Society, retired on October 1.

J. B. SHAW, M.D., chief of the Hospital Division, Public Health Service, has been assigned to supervise Indian Affairs, Department of the Interior, Washington, D. C.,

* Fellow.
† Member.

succeeding FRED FOARD, M.D.,* who retired in 1952.

WILLIAM P. SHEPARD, M.D.,* who has been in charge of the Health and Welfare Division, Pacific Coast Head Office, Metropolitan Life Insurance Company, San Francisco, since 1926, has been transferred to the New York Office of the Metropolitan to assume charge of the company's entire Health and Welfare Program as second vice-president on January 1, 1954.

HOMER F. SWIFT, M.D., member emeritus of the Rockefeller Institute since 1946, has received the distinguished service award of the American Rheumatism Association for research in rheumatic fever, the second time that award has been made in the association's 23 years.

MATTHEW TABACK, Sc.D.,* former director of the Bureau of Biostatistics, Baltimore City Health Department, has been appointed director of the Statistical Section, succeeding W. THURBER FALES, Sc.D., deceased.

MARGARET H. TRACY * has resigned after 22 years of service with the Health League of Boston and the United Community Services and will spend the coming winter traveling in Europe before returning to her home at 9 Commonwealth Avenue, Boston 16.

WARREN T. VAUGHAN, JR., M.D., recently of the staff of the Harvard School of Public Health, has become director of the Division of Mental Hygiene, Department of Mental Health, Boston, Mass.

MARVIN G. WALTERS, former sanitarian, Nebraska State Health Department, is now assistant to the director of the engineering services, Louisville-Jefferson County Kentucky Health Department, to manage the section on food and sanitation.

FRANK W. WEBSTER, former field secretary, American Trudeau Society, has been made its executive secretary, New York City.

P. K. WHELPTON,* formerly director, Population Division, United Nations, while on a leave of absence from the Scripps Foundation for Research in Population Problems, Miami University, Oxford, Ohio, has returned to the foundation as director.

RUTH WILLIAMS, coordinator of women's activities, National Foundation for Infantile Paralysis, has resigned to become regional director for the western area, Muscular Dystrophy Associations of America, Inc.

JULIUS LANE WILSON, M.D., director of clinics and professor of medicine, Henry Phipps Institute, University of Pennsylvania, Philadelphia, has been named the first director of medical education for the American Trudeau Society, the Medical Section of the National Tuberculosis Association, serving on a part-time basis.

* Fellow.
† Member.

DEATHS

LEONARD A. DEWEY, M.D.,† director of chronic disease control program, Washington State Health Department, on September 8 (Epidemiology Section).

FRANK R. FERLAINO, M.D.,† medical director, General Motors Corporation, New York, N. Y. (Industrial Hygiene Section).

C. R. HOSTETTER,† health officer and secretary, Palmerton (Pa.) Board of Health on October 9, 1952 (Health Officers Section).

A. JUDSON KEMPER, M.D.,† health officer, Harrison County (W.Va.) Health Department, on September 12 (Health Officers Section).

ALBERT S. MCCOWN, M.D.,* director, Communicable Disease Control, Virginia State Department of Health (Epidemiology Section).

FRANKLIN J. MALONE, M.D.,† Montgomery County (Tenn.) health officer on September 7 (Health Officers Section).

ELLEN D. QUINLAN, R.N.,† assistant director of nurses, Hamilton County (Ohio) Department of Health on August 12 (Public Health Education Section).

FLORENCE R. SABIN, M.D.,* died in Denver, Colo., October 3 at the age of 82. Well known for her work in anatomy, Dr. Sabin was a member of the Anatomy Department, Johns Hopkins University, 1901–1925. From 1925 to 1938, when she retired, she was a member of the staff of the Rockefeller Institute for Medical Research, New York City, where she conducted research in blood and blood diseases, in tuberculosis and in brucellosis. Returning to her home in Colorado in 1938, she began her third career by drafting a modern health program for Colorado based on a state-wide survey conducted by the American Public Health Association. A reform of Colorado's public health laws and later of Denver City and County organization was effected. Dr. Sabin had honorary degrees from 12 institutions of higher learning, and among many other honors had received a Lasker Award of the American Public Health Association in 1951 for public health achievement.

RENÉ SAND, M.D.,* Institute de Médecine Sociale, Bruxelles, Belgium, an Honory Fellow of the APHA, on August 23 at the age of 76.

F. MICHAEL SMITH, M.D.,† director, Warren County (Miss.) Health Department on July 22 (Health Officers Section).

CONFERENCES AND DATES

American Public Health Association and 24 Related Organizations. 81st Annual Meeting, New York, N. Y., November 9–13.

State and Regional Public Health Meetings:

Nebraska Public Health Association. Lincoln Hotel, Lincoln. November 19–20.

Oklahoma Public Health Association. Mayo Hotel, Tulsa. December 3–5.

South Dakota Public Health Association. Huron. November 20.

Meetings of Other Organizations Coming in November, December, 1953, and January, 1954:

American Academy of Tropical Medicine and the American Society of Tropical Medicine and Hygiene. Brown Hotel, Louisville, Ky. November 12–14.

American Cancer Society. Annual Meeting. New York, N. Y. November 2–6.

American Medical Association. Clinical Session. St. Louis, Mo. December 1–4.

American Occupational Therapy Association. Houston, Tex. November 13–20.

American Public Welfare Association. Biennial Round Table Conference. Edgewater Beach Hotel, Chicago, Ill. December 2–5.

American Statistical Association. Shoreham Hotel, Washington, D. C. December 27–30.

Association of State and Territorial Health Officers. Annual Meeting. Washington, D. C. November 4–7.

National Social Welfare Assembly. Annual Meeting. New York, N. Y. November 12–13.

National Society for Crippled Children and Adults. Chicago, Ill. November 9–11.

National Society for the Prevention of Blindness. Annual Business Meeting. New York, N. Y. December 17.

Pan American Medical Association. International Medical Cruise Congress. S. S. Nieuw Amsterdam. January 6–22, 1954.

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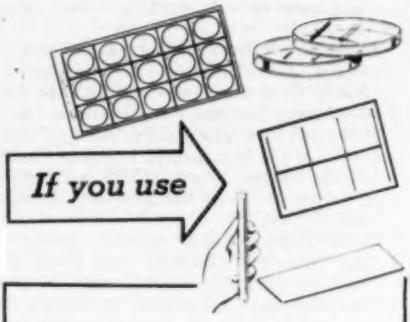

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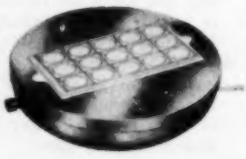

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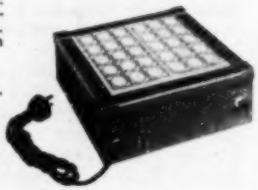

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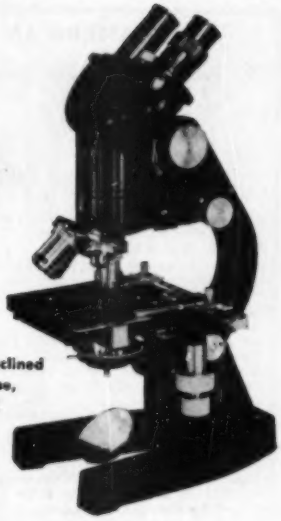

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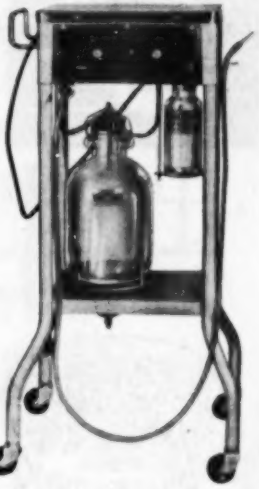

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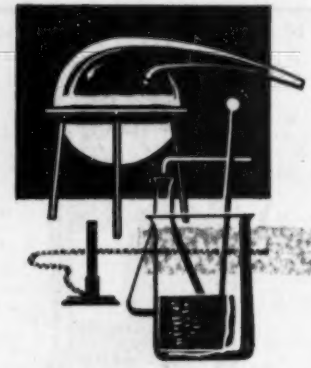

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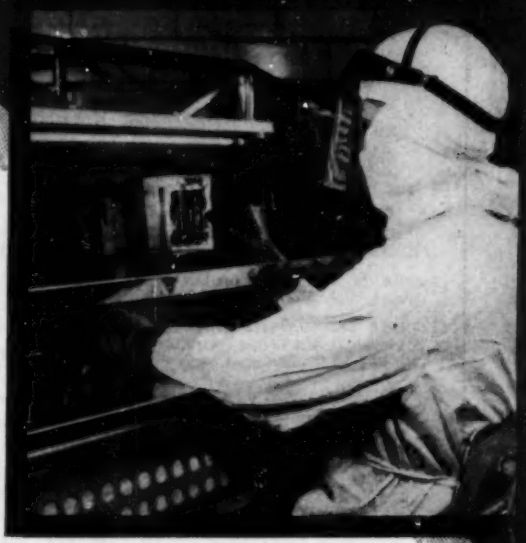

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